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OF

AGRICULTURE, MANUFACTURES, MECHANIC ARTS,
INTERNAL IMPROVEMENT, COMMERCE,

AND

GENERAL LITERATURE.

Agriculture and the Mechanic Arts are the basis of Civilization.

M. TARVER & T. F. RISK,
EDITORS AND PROPRIETORS.

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CULTURE OF FLAX FOR SEED.

Having devoted our leading articles, for some months past, to the discussion of subjects relating to public measures, we turn with pleasure to one more congenial to our taste, and not less palatable perhaps to our patrons. We delight to commune with the tillers of the soil, the men who minister at the great fountain of civilization, dispensing thence the elements of subsistence and of comfort to those employed in all other departments of industry. We delight to investigate the properties of inorganic matter; to trace their transformations into organic forms; to watch the mysterious developments of germ, foliage, flower, and of fruit; to contemplate the relations of their developments to the animal kingdom, and, finally, to follow up the line of observation until we discover that wonderful phenomenon, the human mind, endowed with faculties capable of directing and modifying the laws of its own existence.

Of all men else, the tillers of the soil occupy the best position for observing the properties and economy of nature: they may be regarded as the priesthood who preside over her mysteries, and officiate in her temple: to them are given the first and fairest fruits of the season: in their hands is the "staff of life," and from their abundance the families of the earth are filled and clothed.

Thus highly favored, it should be the aim of all to improve the advantages which their station affords; for ignorance and improvidence are not less fatal to the prosperity and happiness of the agriculturist than to the merchant or artizan. It is not sufficient, to insure prosperity, that he should merely understand the art of producing crops of various kinds; but, he should be well informed in respect to the demand and supply of all commodities that his own particular location and means will enable him to produce with profit; for, upon the observance of these facts, the prosperity and wealth of agricultural communities must ultimately depend. The profits accruing from the labor of one or of several years should not be regarded as proof sufficient to establish the fact, that the cultivation

of any particular plant will prove profitable in the end. Before the profits of labor can be ascertained it must be known to what extent the soil has suffered deterioration; and a sum, sufficient to pay the expense of restoring it must be deducted from the value of its products.

No country can prosper long under the cultivation of only one staple; for we esteem it a well established fact, in agricultural economy, that all plants deteriorate if planted on the same ground throughout a series of years in succession. And it may be regarded as incontrovertable that the wealth of a country will, in the course of time, correspond to the number and variety of plants cultivated by its inhabitans; and, that the region capable of producing the greatest variety of useful plants, is calculated to sustain the largest number of people, and the greatest amount of wealth in proportion to its area. It is therefore the true policy of every community to diversify their crops so as to embrace every plant that will afford a remunerating profit—always bearing in mind that the profits of labor are diminished or enlarged in proportion to the deterioration or improvement of the soil.

Moreover, to ensure remunerating prices, the producers should limit the production of their leading agricultural staples to a degree that will enable them to control the market; for, by the laws of commerce, the money value of each class of commodities bears, in general, a uniform proportion to the entire volume of commerce, including money; and, consequently, when the production of any one staple has reached a certain point, an increase in quantity adds nothing to its aggregate value in market: indeed, if the overproduction be large, for a few years in succession, it may happen that the aggregate value of the crop will be greatly reduced. For in such case the *consumers* control the price, and it is evident that they will continue to depress it until the depreciation reaches a point that will drive the producers into other pursuits. This has frequently happened to the planters and farmers of the United States and it is by no means creditable to their intelligence and foresight that they have rarely abandoned, or even limited, the cultivation of a staple, when once adopted, until driven to do so by necessity.

Judging from the present prices of Western staples, one might conclude that they were not depressed by reason of overproduction; indeed, the prices of all may be regarded as highly remunerating: but such has not generally been the case, nor can the present state of things be regarded as permanent. The present prices are in part attributable to the California emigration, which is now rapidly returning; and we may expect that the demand for labor will again be fully supplied during the present year: and, that the farmers, influenced by the present high prices, will increase the quantity of land put in cultivation to an extent that will, in case the seasons prove favorable, result in reducing the prices of all their products.

Now, if instead of extending the breadth of land for the cultivation of the leading staples other plants could be introduced, which would pay remunerating prices, the product of these would be so much added to the money value of the crop; for unless there should be an increase in the quantity of the staples usually grown in this region, the prices may be expected to continue at rates similar to those which have prevailed throughout the last year.

In selecting a new plant for cultivation, we should regard its adaptation to the climate, soil, and habits of the people of that region where its introduction is proposed: also, the convenience of growing it in connection with other crops; the profitableness of its culture, and, finally, the nature and extent of the demand—whether at home or abroad—and other things being equal, the culture of those plants should always be preferred which are consumed nearest to the place of production. This should be regarded as a cardinal principle in political economy: and it may be confidently affirmed that where it is not observed the degree of prosperity and wealth can never be equal to the natural resources of the country.

We have, in the preceding volumes of the Western Journal, so frequently urged the observance of these principles that we should not now recur to them but that we desire to present, under one view, as many arguments as our limits will admit in favor of diversifying the crops of the Mississippi valley. There are several valuable plants the cultivation of which might be introduced or increased with profit in this region; but we shall confine our discussions chiefly to the cultivation of FLAX FOR SEED.

By reference to our commercial statistics we find that there has been a great falling off in the production of flax seed in the West within a few years past. This was a natural consequence of the Mexican war and the California emigration; for as labor becomes scarce from any cause whatever those commodities which are produced for market only, and not of a nature to be consumed at home, are the first left out of the general crop; and when once abandoned are not likely to be taken up again so long as other plants continue to pay a reasonable profit. From such causes the production of flaxseed has been greatly reduced, within a few years past. The quantity received at St. Louis, by the river, in the year 1848 was 12,257 sacks and barrels; in 1850 it was only 2,348: while, during the same period, the imports of linseed oil at this place increased from 780 barrels in 1848, to 2,587 barrels in 1850. About one half the quantity imported last year came from England: the other half from the Ohio river: and yet, we remember to have observed, some months since, that importations of foreign oil had been received at Cincinnati. The foreign article, when delivered in store at St. Louis, costs about one dollar and five cents per gallon: a price that would authorize the manufacturers at this place to give nearly, if not quite, $2.00 per bushel for flax seed.

Now, we believe, it would be difficult to find another branch of

trade throughout the entire circle of commerce involving so many curious facts, or so many absurdities, as are presented by the present condition of the oil trafic in this and other countries. England imports flaxseed from every quarter of the globe: from America, Asia, Egypt—Italy, Russia, and other parts of Europe. In Scotland, flax is cultivated on land the rent of which costs the farmer from £3 10s. to £4 per acre;* a sum nearly equal to from $17.00 to $20.00; flax seed is, or was some years since, charged with a duty upon its importation into Great Britain;† and, a duty of 20 per cent. advalorem is charged on the importation of oil into the United States; and yet, burdened with all these charges, to say nothing of freights, commissions, insurance, warehousing, merchants profits, interst on capital invested, and many other incidental charges, about one half of the linseed oil now being consumed in the heart of the Mississippi valley is imported from Great Britain. While the farmers of this country are looking to Great Britain for a market, in which to dispose of their grain, they are consuming oil manufactured there from seed grown in other countries, or, perhaps, on land in Scotland that rents for from $15 to $20 per acre: a price more than double that of the fee of their own rich prairies.

We are not practically acquainted with the culture of flax; but we are assured that no part of the globe is more favorable to its growth than the northern parts of Illinois and Missouri; and, except that the oil cake is not worth as much here as in some other parts of the world, there is not, perhaps, any other place where oil can be manufactured cheaper than in St. Louis. We are informed, by the proprietors, that the machinery now in operation, and being put up, in this city is capable of pressing 250,000 bushels of flax seed per annum. One establishment, that of H. T. Blow, is of itself capable of consuming 160,000 bushels per annum. This is the first instance, we believe, in the history of the West, where the facilities of manufacturing have so far exceeded the supply of raw material. But even this amount of machinery, if fully employed, would be inadequate to supply the demand for oil in the United States. In the year ending 30th June, 1849, we imported 1,163,647 gallons of linseed oil and 211,442 bushels of flax seed. The oil, except about 9,000 gallons came from England: 181,014 bushels of the flaxseed came from the East Indies, a country from which we imported in that year merchandize to the amount of $2,036,254; whilst our exports thither amounted only to the value of $409.524; hence it may be observed that we even import flax seed from a country that sends us four dollars worth of its own products to every one it receives of ours in exchange—the balance we of course pay in money, or with the products of other countries.

* Vide Reece's Encyclopædia. Title Flax.
† Vide M'Culloch's Commercial Dictionary.

That class of economists who regard foreign trade as the only means by which a nation can acquire wealth, would doubtless imagine that the farmers of Missouri would derive great profit by shipping their corn and pork half way around the globe to be exchanged for flax seed: but, we scarcely believe that even they would esteem it good economy to send money to the East Indies to exchange for an article which could be so easily produced at home.

But we can scarcely hope to change the pursuits of the agriculturists by arguments touching public policy or national wealth; for although, as a class, none are more patriotic, yet, it is natural that they should labor in reference to what they esteem their individual interests.

It is not our province to advise: our principal aim is to furnish such facts and arguments as to them may not be familiar.

By reference to our commercial statistics, we find that throughout the larger portion of last year, flax seed sold at $1.50 per bushel, and that in April and December they were sold as high as $1.60 per bushel. It is pertinent here to inquire whether these prices are likely to be sustained for any considerable time? The following extract from "the Boston Price Current" of 22d ultimo, contains the latest accounts we have in reference to the condition of the oil trade in this country and in England:

"The market is very quiet for Linseed Oil but firm. Sales of 1,500 gals. English at 85c. cash, and but very little in market. American is held at 85c, cash. In relation to the Linseed Oil trade, the following from the Annual Statement of Wright, Young & Wright, of Hull, England, is worthy of consideration:—"The position of the trade at the opening of the new year is not encouraging. Our stocks of Linseed are not large, prices unusually high, and the manufacture of Oil Cakes limited and unprofitable; and looking forward—with the almost certainty of deficient supplies abroad, quotations at all the export markets considerable in advance of last year's currency, and relatively much higher than in this country, and Linseed Cakes restricted in sale and depressed in value,—prospects are scarcely more promising. The one redeeming feature is the great demand and high and increasing value of Linseed Oil; but to bring the trade into a healthy state there must either be an increase in the consumption of Cake, now greatly reduced by the mildness of the season, or such a limitation of the manufacture as would act inversely on the value of Linseed and the manufactured articles; this course has of late been acted upon, nearly one-half the mills being now either engaged on Rapeseed or entirely closed, and the result is already shown, partly in curbing the upward tendency of the Linseed market, but more fully in enhancing the value of Linseed Oil and imparting a firmness to the Cake market which would otherwise not have existed. The present stocks are no more than adequate to supply the present rate of consumption into the Spring, and as but little can

be expected to arrive prior to that period, prices may, and probably will, go higher. But as respects business for next season's shipment, whether the crushers will be able to pay the high quotations now prevailing in all the export markets, must in our opinion mainly depend on an improvement taking place ih the value of Cakes."

From the foregoing statement it may be fairly inferred that the present prices of Linseed oil and flax seed will be sustained until another crop goes to market.

The question then arises whether flax seed at one dollar and fifty cents per bushel is more profitable to the grower than the crops now usually cultivated.

This is a question which the experience and observation of each farmer will enable him to answer for himself; and must be determined by the peculiar character of his soil, distance from market, and other considerations relating to the economy of his establishment. Again, it is proper to inquire into the extent of the demand; lest we should overstock the market and reduce the value below a remunerating price before any profits are realized. We have not yet received the Register's report of the commerce of the United States for the year ending 30th June 1850, but we find it stated in the Railroad Journal that there was imported during that year 1,513,117 gallons of linseed oil. Now, if we reduce this to flax seed and assume that the importation of the latter was equal to the quantity imported the preceding year we shall find a deficit of flax seed, of American growth, for the year ending 30th June, 1850, amounting to 968,000 bushels, which at present prices amounts to $1,548,800, a sum equal to about one fourth of all the flour exported from the United States during the same period. Thus it will be seen that the crops of the United States must be increased nearly one million bushels before the home demand can be supplied; and it is not reasonable to suppose that this demand can be filled in less than from two to three years; for the scarcity of seed will prevent any considerable increase in the crop of the present year.

Now, we are persuaded that if the farmers of the West will examine and properly consider the foregoing facts they must arrive at the conclusion that they cannot make a better application of their labor than in the culture of flax for the seed. We can understand the reason why iron, for instance, can be produced in Great Britain cheaper than in this country—its money value is made up almost entirely of labor—but the rent of land being the principal item in the cost of flax seed, we are unable to comprehend how it is that the English or Scotch farmer can grow this article in competition with Russia, and, that oil can be shipped from England to the United States, and, after paying freight, duties, and all other charges, drive our farmers out of their own market: when, too, they are endeavoring to produce wheat to feed the English people.

It is admitted that flax, when grown for seed, is a great exhauster of the soil: and for this reason it is said that the English farmers have, to a great extent, abandoned its culture. This is certainly a great objection to growing it as a staple: but it is not as a staple that we advocate its cultivation: it does not seem to have been designed as such by nature: for the plant accomodates itself to every climate where man can make a comfortable subsistance by agriculture. Therefore, as an article necessary to the wants of civilization, every country should produce its own supply, and each farmer sow a limited quantity of ground; but not so much as to interfere materially with his other crops. In this way our markets would be abundantly supplied; and the exhausting effects of its culture but little felt, especially where land is so abundant as in the western States.

Our information in regard to the yield of the crop per acre is too imperfect to authorize us to give an opinion on that point. We find, in the authorities which we have examined, that the crop ranges from ten to perhaps thirty bushels per acre: all agree that the land should be rich, and prepared for seeding with great care. Again, we find great discrepancies in respect to the quantity of seed proper to be sown; this will depend mainly upon the purposes for which the crop is grown. If designed for the production of a very fine fibre, the ground is very heavily seeded; but if designed for the production of seed only, it is sown thin. We have seen it stated, in an English authority, that from six to eight quarts to the acre was the usual quantity sown where it was intended for a crop of seed. All agree that the crop should be sown as early as the season will admit; but as the proper adjustment of these details depends on climate, soil, and other causes, they must be left to the experience and observation of the farmers of each particular district of country.

Great efforts are now being made, especially in England, to discover new methods of preparing and manufacturing the fibre; and discoveries have recently been announced which are calculated to give an immense impetus to flax growing, should they produce the results ascribed to them. It is affirmed that a process has been discovered that imparts to the fibre the softness of cotton, warmth of wool, and glossy appearance of silk: but the plant must be cut before the seed is ripe. Admitting these facts to be true, there will spring up a demand for flax seed that will constitute it one of the great staples of commerce; and the fibre may again become the great staple of human clothing.

ARTICLE II.

(Continued from page 192.)

No. III.

A FEW HINTS TO THE FARMERS ON THE CULTURE AND MANAGEMENT OF HEMP.

In my last article, I said that our American hemp was very dull in the east, so much so, that one holder intended offering five hundred bales at auction, as it could not be sold otherwise.

Since that article was written, a business house of our city has received a letter from one of the largest hemp houses in New York, giving the result of that sale, and indulging in a few reflections on the subject of preparing hemp, which so fully coincide with what I have written, that I have thought best to preface this article with an extract from said letter, to convince even the most incredulous, that American hemp is not what it has been, nor what it should be; and that it becomes all to unite in one common effort to raise the standard of the quality of an article of such vast importance to our State:

"The sale came off to-day, (6th inst.,) but was stopped after about 250 bales had been disposed of, mostly at $105 to $110, four and six months—quality ordinary. One lot sold as low as $95. The importance of having hemp properly dressed and prepared for market, cannot be too strongly urged upon the growers; for unless the quality the coming season is better than that of the past, it would hardly be worth while to send it here. With anything like good supplies of Russia, it would be entirely neglected, except for Bale Rope and the like uses. Nothing will illustrate the correctness of this better, than the fact, that at the present unusual difference of over $100 per ton, between American and Russian, it is almost impossible to sell the former."

Every one at all conversant with the article of hemp, will recollect that the crop grown in the year 1842, both in Missouri and Kentucky, was of a very superior quality, when compared to that which is now sent to market. Of that crop of hemp, 14,873 bales were shipped east, against 1,211 the year previous. Its quality was so well liked, and the price being cheaper than Russian, it went into almost general use; so much so, that the imports of Russian hemp for the year 1844 were only 400 tons, whilst in 1843 the imports were 4,000 tons.

As every one must by this time be convinced that we are not writing merely to while away an hour, nor to fill a column, but for the consumation of an object, which, if properly attained, will be worth millions of dollars to our State, we will now hasten on to

the few hints I promised to throw out relative to preparing dew rotted hemp for market.

I must acknowledge, that I feel conscious that I shall be touching upon a subject upon which no person could write so as to please all; but I shall be content, if I can only be so fortunate as to awaken a new interest upon this matter in the minds of hemp growers.

As it is now mid-winter, the crop of hemp grown the past summer is, for the most part, spread out upon the field to *water* or *rot*, as it is called; but I could not do justice to the subject, if I did not treat of the article in an earlier stage than this. Indeed, I should go back to the sowing in the spring, or even beyond, to the ploughing up the ground once in the fall preceding.

In all portions of Europe, where hemp is raised, the greatest care is paid to the preparation of ground, before receiving the seed. It is there invariably ploughed over three times—once in autumn, and twice in the spring. At the last ploughing, no more ground is ploughed up per day than can be followed up by sowing on the same day, as the seed falling into loose and moist ground produces in consequence a considerable increase in the crop.

Great care should also be taken to have the best and soundest seed, and not to raise more than two crops on the same spot, from seed grown on the same field.

The quantity of seed sown to the acre should depend upon the fabric intended to be made of the hemp; for if the seed be strewn thinly on the ground, the hemp will be coarse and suitable only for heavy cables or bale robe. Seed sown very thick will produce tall thin stalks, with fibres fine and silky, suitable for fine cordage, sail cloth or even fine linen.

As Kentucky can raise nearly enough hemp to be worked up into rope and bagging, I would here suggest that the Missouri farmers make an effort to raise a superior quality of hemp to manufacture into the finer fabrics, by which they will always be enabled to get the best prices; besides, if they all *try* to make the first quality of hemp, there will always be mistakes and mishaps enough to make as much poor hemp as will be wanted.

After the hemp is grown up, ripened, and is cut, it requires then the greatest care to manage it as it should be. The unfarmer-like manner of leaving hemp down, from the hook or cradle, all summer, cannot be too strongly condemned; for it blackens, sunburns, indeed ruins the hemp for all purposes, except for the most common or cheapest.

The farmer should never allow his hemp to lay longer than two or three days after it is cut, merely to cure or dry the sap that is in the stalk.

He should then have the hemp tied up into small bundles and put into shocks, so that any of the stalks not yet cured, shall become so, previous to stacking.

Nearly all of our Missouri Farmers leave their hemp in the shocks; those that do not, leave it on the ground to *rot* emphatically, because they say they have not time to stack it. To all such we would say, put in no more hemp than you can stack, and then be sure it is done in the best kind of style, to protect the great bulk of your hemp from the rains and weather.

Where is the use of a farmer ploughing up his ground, sowing his seed, cutting down the hemp, and then letting it lay there and rot, as some do; but mostly it is gotten into shocks of small dimensions, and there remains to injure by the beating rains that fall for two or three months. When the exterior of all the shocks is thus injured, and indeed the interior of them does not always escape serious damage, being so poorly protected from the weather, it is not to be expected that the lint of that hemp can ever be fair or strong. In fact, the real intrinsic value of the hemp is half gone and never can be remedied.

Stacking the hemp has several good effects. It passes through a sweat, and makes the lint fair and uniform, and this uniformity is particularly needed, since in this country we do not pull or cut the male hemp first, by several weeks, as is done in Russia, the female hemp being some six weeks later in ripening.

The whole crop of hemp being well stacked, it were best to let it remain so for one year, for the purpose of bleaching, or having it nearly as fair as water rotted, provided it is then spread out on grass lands, so that the rain and dirt will not stain the lint. This hint, however, I do not expect many of our farmers will take, as they cannot persuade themselves that they can afford to lay out of their money for a whole year, although they might get twenty-five per cent. more for their hemp by doing so. The first crop only lays over; after that they will have a crop every year of "stacked over" hemp to water and break out for market.

When the farmer spreads out his hemp to *water*, he should be very careful not to allow it to remain on the ground too long, and thus become too much watered or rotted as is more frequently the case than otherwise, as we see clearly evinced in the unusual portion of tender and dark hemp that has recently been sent to market. After the hemp is ready for the brake, too much care cannot then be bestowed upon it, as it is all important to handle it neatly and carefully, besides freeing the lint from all the wood or shives.

Some contend, and seemingly with very good reason too, that the present manner of breaking hemp is calculated to make the lint towy; as the lint upon the stalks is not all of equal length.

I would therefore recommend the farmers to draw the hemp through the brake in a manner reverse from that which is now the most common custom. Let them begin at the *butt* end of the stalks and break enough to hold on to; they can then begin to break and clean the blossom end and work on up towards the butt

end, *always* drawing the hemp through the brake, from the butt towards the blossom end.

I am very much inclined to the opinion, that if this mode of dressing hemp be adopted, that we shall see far *less* towy hemp than we now have, as there is said to be really no tow in hemp if rightly managed.

The hemp after being properly broken and dressed, should be put up into neat small hands, weighing about a pound and a half. Indeed, a farmer should not allow any hand to break exceeding a pound or a pound and a half at once, for he can not properly handle and clean it, if he does. In Russia a few stalks only are broken at once.

We have now, in a very hasty and consequently imperfect manner, hurried through our suggestions on the preparation of dew rotted hemp for market, and have it now ready for baling. On this point there is probably more difficulty in the way than in anything else of which we have been speaking. It is here that most of the defects in the hemp are covered up. *Break tow*, *strings*, *half broken hemp*, *rotten* or *injured hemp*, and sometimes *rocks* and *dirt*, are frequently found in the interior of bales; thus injuring the reputation and price of the good hemp, by the carelessness of persons who lose sight of their interest in this staple.

As I have already extended this article too long, I shall reserve the balance of my remarks on baling for my next, adding here, in conclusion, that every farmer who raises hemp would do well to build him a good, tight hemphouse, (if he has none,) so that he can properly take care of it, after it is broken out, and not to throw it up in his stable loft or some open building, as is frequently the case, for the rain and snow to beat in upon it for two or three months.

No. IV.

SUGGESTIONS ON BALING, AND A HEMP INSPECTION LAW.

I will now redeem my promise to make some suggestions on the subject of baling hemp; a matter in which our farmers and balers have been greatly at fault. And as baling hemp *properly*, presupposes an *inspection* or a selecting out the various qualities to bale, each to itself, I have naturally concluded that wise and judicious legislation would assist us all, who have the interest of this great staple at heart, to remedy an evil that has been proclaimed aloud from every city in the east, as well as in the west.

All are doubtless aware of the crude manner of preparing hemp and baling it for market, and that something should be done, and that quickly too, to save this staple from almost utter ruin, by depreciation in quality.

Yet to hint at legislation, I fear, is something like a doctor prescribing a dose of medicine to a sick patient; the man knows that he is sick and feels that some remedy should be administered to him, but he makes a wry face and looks grum if you talk of medicine. So it may be with some of our farmers or balers when I come to offer my *legislative dose*, however *sugar coated* it may be.

I am no doctor, neither of medicine nor of *baling hemp*;—we have a few, by the way, in our State, of the latter order, whose honors are such as to entitle them to one more *degree* in that science. They should then retire in peace and contentment, to live out a happy and quiet life, with a conscious blush mantling their brow, that they have done the State some service.

I have said that judicious legislation would assist in bringing about a change in the manner of selecting and baling hemp; and I will now, with all due deference to men of experience on this subject, throw out some hints upon the proper manner of assorting hemp and baling it; and at the same time give my views of what is desirable to be done, in the way of a law, by our Legislature this winter. And I trust any suggestions I may make, will be received in the same kind spirit in which they are tendered.

With all the care and attention that the farmers can or will bestow upon their hemp, there will be unavoidably about as many qualities, when it is ready for the press, as there are in cotton, of which there are ten or twelve in the New Orleans classification, which assimilates to the Liverpool, viz:

Inferior,	Ordinary to good ordinary,
Low middling to middling,	Good middling,
Middling fair,	Fair,
Good fair,	Good and fine.

This classification of cotton is understood by the brokers and dealers in the article, as well as by the planters who raise it. It is a *misdemeanor*, and punishable by law, for a planter to falsely pack his cotton, and he knows very well that he can be sued for *fraud*, if the interior of the bale does not agree in quality with the exterior.

We have, then, several qualities of hemp, which, like cotton, should be selected at the farmer's own warehouse, where he has, or should have, plenty of room to stow the several qualities separately, previous to baling himself, or delivering it at the river to be baled.

Hemp is in another respect like cotton; it has to go to market in tightly compressed bales, so that that which is in the interior of the bale cannot be seen or gotten at well, without taking the bale to a warehouse, and cutting it open, for a thorough examination.

This process would subject the article to too much expense, inconvenience and delay; and hence the necessity of making a law to require the farmers and balers (the farmers should ultimately bale all of their hemp,) to *assort* the different qualities of hemp *previous* to baling, and to put but one quality as nearly as possible, into a bale, so that the hemp in the bale should be uniformly alike. If this can be done, and it *can* be, if the Legisiature will only *will* it so, as herein set forth, there will be no necessity for a hemp inspection in our city.

I would, therefore, suggest that our Legislature pass a law, the coming session, at an early day, to be entitled *An Act to regulate the inspection of hemp.*

Let the *act* set forth, that no person shall keep a public warehouse for the purpose of inspecting and baling hemp, until he, or they, shall have taken out a license for the same, and entered into bond in the sum of one thousand dollars, for a faithful performance of the business for which he is licensed.

I would have the license to cost a nominal sum, as I deem it iniquitous to raise revenue for the State by taxing professions and occupations, except it be where they are deleterious to the public morals.

As I have already said, there are about as many qualities in hemp as in cotton; yet, for all practical purposes, there is no necessity of having hemp assorted and marked, or branded, into more than *four* qualities, as follows: *Inferior*, *fair*, *good* and *prime*. Have the law, then, to require the licensed baler at his public warehouse, and the farmer at his own house, without a license, to make these four articles of hemp, wherever the article requires it. I would describe the four qualities thus: *Prime hemp* shall be of the first quality of dew rotted, of a *fair* or *lead* color, fine and silky fibre, that is strong and free of shives.

Good hemp is the second quality, and is of that class of hemp which has not the good color and strength of the prime; is coarser and harsher, yet containing *very few shives*, and like the prime is handled neatly.

Fair hemp is the third quality, and will include such as is tender, from over-rotting, or such as is *shivy*, *towy*, or handled roughly. This quality is generally of a dark color; and about three-fourths of that received here within the past two years, would be ranked in this class, as it has had *all* the requisites for *fair* hemp.

Inferior hemp is of the fourth class, in which we will include *all* that is below *fair*. If hemp should be watered entirely too much, so as to make it very dark and tender—although *all* the shives may be taken out—yet the lint is *inferior*, and the bale should be so branded. If, on the contrary, the hemp is not watered enough, too many shives are allowed to remain in it, and this class of hemp should also be marked *inferior*.

I have now given you four classes of hemp, which, I think, can easily be distinguished by men who understand the article, and of course such only should be allowed a license to inspect and bale hemp. It cannot be expected of a farmer or a public baler, to select the article into as many grades as there are in a Liverpool classification of cotton, although these nice distinctions do exist. Such nice shades of difference do not generally belong to the same crop of hemp, but to crops raised by different farmers. And here the good judgment of the merchant who sells, and the speculator or manufacturer who buys, is brought into requisition. Hemp should only be sold in our city by those who thoroughly understand the article, and the buyers should have an equal knowledge of it, or, they would save two commissions by paying some good hemp merchant, or broker, to purchase for them. All that can be done, all that I ask, is to give us a law, describing the four grand divisions I have given; compel the baler, whoever he may be, to bale the four qualities separately, put his name in full on a *board*, the name of the grower, the year in which it was grown, the quality and the weight; and, my word for it, we shall at once see as great a revolution in the management of hemp, as there has been in the management and baling of cotton, since the enactment of very strict laws upon the subject, by the States interested.

I think it is high time that we were learning something on this subject by experience. In Russia, where they have been growing hemp from time immemorial, and raise now 120,000 tons per annum, they have learned to manage it rightly. That Government appoints sworn *selectors*, whose duty it is to assort the hemp according to its quality; into *clean* hemp or *firsts; out-shot* hemp, or *seconds; half-clean* hemp, or *thirds*, and *hemp codilla*. They have also *sworn* balers, who are bound to bale it as selected by the *selectors*. The baler is also bound to brand the hemp very carefully, upon two pieces of lead attached to each bale for that purpose; I prefer, however, the board, as it cannot be lost so easily from the bale.

If, then, we would be wise, we would learn a lesson from Russia, and imitate her wisdom, by fostering and protecting a staple which, by care and attention, would in a very few years yield us millions per annum more than it now does.

Hemp is an article that requires the greatest care to protect it from dampness, as it will heat, directly, with the least dampness, then mould and rot. A law cannot, therefore, be too particular, in requiring steam and other boats to use care in the manner of handling and delivering it on our Levee.

I do not fancy a large bale, by any means. If tightly pressed, as all bales should be, they are too heavy, and always unsightly. A bale of hemp should be of convenient size to carry, when the ground is too damp to roll it on.

The prettiest and most convenient size bale, I think, is forty-

four inches long by twenty-two wide, and pressed down to eighteen or twenty inches; so that when the press is taken off, the hemp will not rise more than to make the bale twenty-two inches deep. We have, then, a bale that will pack into a warehouse or a boat, closely and squarely. It will weigh from three to three hundred and fifty pounds, according to the quality of the hemp, and should have seven good rope bands to hold it securely.

Could I but only inspire the hemp raiser to see his interest, as I see it, we would then begin a new aud bright era in the history of hemp culture. We would no longer have the demerits of our hemp sung in our ears, until we are weary with the song.

Let farmers, legislators, merchants, and all, take hold of this important subject, and rid it of the mismanagement that has brought discredit and nearly ruin upon the staple that shall, one day, if all do their duty, be the pride of our State.

Our fine hemp lands can be made to yield an article, the *refuse* of which will be good enough for rope and bagging; whilst the better qualities can be wrought into cordage and sail cloth for our merchantmen and men-of-war, and fine linens, suitable for summer wear, can and will be made of Missouri hemp, whenever the quality will justify it.

The white sail of the American vessel that now floats upon every sea, should not only be wrought of American hemp, but it should be made to waft to the four qurters of the globe cargoes of American hemp, to compete in all the great markets with the European article.

No. V.

FACTS AND FIGURES TO SHOW THE NECESSITY OF A BETTER PREPARATION OF DEW-ROTTED HEMP, AND THAT *WATER ROTTING* SHOULD CLAIM THE ATTENTION OF OUR HEMP RAISERS.

I will now close this series of articles, by giving, in conclusion, a few facts and thoughts, to show more conclusively the importance of a better preparation of dew-rotted hemp, and the reason why our hemp raisers should turn their attention, in part, to *water-rotting*.

A writer for the *Louisville Courier*, in 1844, estimated that during that year, in the States of Kentucky, Missouri, Tennessee and North Alabama, there would be 21,000 tons of bale rope and bagging manufactured, or enough to cover 2,625,000 bales cotton; more than was required to cover the entire cotton crop. There

was, also, that year, a large surplus of rope and bagging lying over from the previous season; besides there were from 5,000 to 8,000 tons of surplus hemp, yet in hands of the farmers.

From which it will be seen that in 1844 there was a large excess of hemp and baling stuffs; and the consequence was, that these articles declined to a very low price (four and five cents for rope, and nine to ten for bagging) during the years '45 and '46. It will be recollected that during the year 1846, hemp, following in the wake of rope and bagging, went down in price, in our city, to $45 and $48 per ton, and was extremely dull at those low figures.

These prices for hemp did not pay the farmer—indeed, it had not been paying for several years previous, and, in consequence, he had to turn his attention to something else, and to shorten his hemp crop—especially in Kentucky.

In 1847, hemp began to be more enquired after, as the excess of rope and bagging was being worked off, and it gradually advanced in price with those articles, until the summer of 1849, when we saw hemp sell here at $125 and $128 per ton; rope and bagging were then worth, in New Orleans, nine and seventeen and one-half cents.

As baling stuffs advanced, more were manufactured than was used, and hence in the fall of '49, they began to give way in price again, and of course, hemp followed suit.

Thus we see our great staple governed in price, almost entirely, by baling stuffs; an article of very limited demand, when we take into consideration our advantages for the culture of hemp.

For the sake of showing the farmers how much hemp, when worked up into rope and bagging, is needed to cover a crop of cotton, we will go into a little calculation.

We will suppose that an average crop of cotton is 2,200,000 bales—this is a full average for the last two years. It is then estimated that six yards of bagging, weighing one and a half pounds to the yard, and as much weight in rope, will cover a bale of cotton—making eighteen pounds to the bale. At this calculation, it will take 17,078 tons of baling stuffs to cover a crop of cotton. But it is thought by some, who should understand the subject, that half the cotton grown in 1850 has been covered by Indian bagging and gunny bags. If this be the case this season, it will likely be so the succeeding years, at least until the present tariff shall be altered favorably for our bagging. For India bagging and gunnies, then, we deduct 4,419 tons, and we have left 13,259 tons of American rope and bagging used in covering a crop of cotton.

With this small demand of 13,250 tons to cover cotton, Missouri can supply it herself, when she raises a large crop of hemp. The crop of Missouri hemp grown in 1849, and brought to market this year, (1850,) will amount to about 10,000 tons. There has been brought to this market, also, about 1,000 tons of rope and ninety-three tons of bagging; making, all together, 11,093 tons, and

only 2,166 tons less than is required to cover the crop of cotton. This deficit could in part be made up by the hemp raised in Tennessee and North Alabama.

Some years since, an average hemp crop in Kentucky was about 15,000 tons, when that State alone raised enough to make all the baling stuffs required.—Kentucky does not now raise so much hemp as she formerly did, yet her crops will probably equal ours, in which case we will have nearly the entire Kentucky crop, or more properly speaking, the Missouri crop, as Kentucky has the rope and bagging establishments, to spare for the Eastern markets.

Since Missouri has gone to raising hemp, it is very evident that too much is raised to work merely into rope and bagging. The consequence has been, that half the time the article did not pay the farmer a remunerating price for the time and expense of raising it. It had another very bad effect, in causing large amounts of rope and bagging to be manufactured, which were not needed at the time, and causing large losses to the manufacturers.

I would not have it understood that the hemp raising States grow *too much hemp*, but I would have it emblazoned upon every paper that circulates in these States, and upon every business letter to a hemp-grower, that there is too much *poor* hemp raised.

It was thought and written, some years since, that Kentucky was in her "youngest infancy" in the culture of hemp, when she was raising 15,000 tons. That sanguine mind looked forward to an improvement in the management of hemp, and hemp machinery, until we should see our Western steamers loaded with the raw article, to be conveyed to the Eastern manufacturer, where it would be worked up into a thousand different articles, suitable for nearly as many different purposes.

Our own Missouri is, in years, in its infancy, in the culture of this valuable staple, yet she too, like Kentucky, has passed the meridian of her glory, in the culture of hemp, unless she shall arouse from her lethargy, and determine, one and all, to raise the standard of Missouri hemp, until its praises shall ring through all the land, and be echoed back from Europe's distant shore.

Hemp is an article that intrinsically has more value than cotton, when rightly prepared; yet the former is only worth four to five cents, whilst the latter is commanding twelve to fourteen cents per pound. The reason why hemp does not go into more general use in this country, and consequently bring a higher price, is found in the fact that it is so poorly prepared, that machinery is not made to manufacture it, to any great extent. Could it be expected that a capitalist would go to work and put up machinery to manufacture the various articles of hempen goods, now being successfully manufactured in Europe, when he knows that he could not get the raw material suitable for his purposes? Certainly no one would be so blind to his interest as to do so.

It then behooves the hemp raisers to go manfully to work and raise an article that is good enough to make into *fine linen*, and from that down to the coarser article of ship cables and rigging. When this shall be brought about, it will indeed be a new era in hemp, for then there will be no glutting the market, although we have in our own State hemp land enough to raise at least 100,000 tons annually. I would not have the farmer to make all of his hemp dew-rotted; not that I think he could make too much of it, if he prepared it well, but I am of the opinion, that some would find it more profitable to them, to *water rot.*

It is known to every body that water rotted hemp is more valuable than dew rotted, and commands a higher price. The process of water rotting being little understood and more troublesome, has deterred nearly every body from undertaking it. The consequence has been, that our American Navy has had to supply her demand for sail cloth and rigging from a foreign article; either manufactured in Europe, or the foreign hemp brought here and manufactured.

American water rotted hemp is equal to the best Russian, as has been proven by several experimental tests of the United States Hemp Agents.

Our government, knowing that we had the best of hemp lands and every facility for the successful cultivation and preparation of water rotted hemp, has for years been holding out inducements to the farmer to prepare hemp suitable for naval purposes.

The inducement offered, not seeming to bring about the desired object, Congress was again induced last winter, to bring up the subject of supplying the Navy with American water rotted hemp, when it could be had.

A law was finally passed to authorize the proper agents to purchase, and give preference to American water rotted hemp, at a price not to exceed the average price of the best Russian hemp for the last five years. The average price of Russian hemp for the last five years, is about $242 per ton. Thus we see our Congressmen and our Government have interested themselves in the culture and preparation of hemp, and have not thought the subject beneath them. They know that we can raise hemp that will suit our Navy, if we will, and the Government is offering every laudable inducement, in the way of good prices, to induce the hemp raiser to make an article suitable for canvass and rigging.

There is no difficulty in the way of our farmers, for a successful competition with the foreign article, if they would but only make the proper effort; for we learn from Mr. Butowsky's report to the Russian government, that in Anjou, in France, hemp lands rent higher than any other arable lands;* and that a hectare (about

* Mr. Butowsky was the agent of the Russian Government, who was sent over all Europe to inquire and report "a statement of the best means of improving the management, cultivation, and fabrication of hemp."

three acres,) will rent for $30, $36 and $40, and in the valley of the Loire, where the hemp grows best, a hectare will rent for $80. Besides the enormous tax that the European hemp raiser has to pay, in the way of rent, he has to manure the ground at quite a considerable cost.

Our farmers have not only the advantage in these items, but there is freight from the country in which it is raised, and 25 to 30 per cent. duty, that the foreign article has to pay.

And yet there is another advantage that our wealthy hemp raiser has, over the poor European peasant; he may avail himself of a recent invention to water rot by steam, and clean the hemp of shives and dress it by machinery.

A small pamphlet, published by the American Flax and Hemp Company, of Schenectady, New York, gives us this short history of this important invention—"Messrs. BILLINGS & HARRISON, of the State of Missouri, obtained in 1845, a patent for rotting hemp and flax by means of artificial heat; and at a later date a patent was granted to Messrs. BERNARD & SCHENCK, of England, for the same invention. This process of rotting flax has been introduced in various parts of England, Scotland and Ireland, and the facts reported to the Royal Society for the promotion and improvement of the growth of flax."

We see that this same Royal Society "passed a unanimous resolution in favor of the American system of rotting," after it had made several experiments on a large as well as on a small scale. This Royal Society highly recommends, what they are pleased to term the American mode of rotting, and adds: "The value of the American mode of steeping, or its equality, in point of efficiency and economy to the usual mode, once admitted, I conceive the above facts of the most extreme importance to the country, as realizing such a large addition of natural wealth, now, to a great extent, neglected and destroyed."

This process is equally suited to rotting hemp, as to flax; and is it not a crying sin that our Missouri farmers should allow a patent of one of her own ingenious and enterprising citizens to be lost sight of, and that England, Ireland and Scotland should be called upon to do justice to it, and reap a rich harvest from it, when we equally need all the aids we can get to prepare our hemp rightly.

I can only hint at this subject now and leave all the particulars of the mode and process of rotting, together with the proper machinery for dressing, for some future occasion, when I may attempt to throw some light on these points, that may be valuable and interesting to those who would like to water rot.

If those of our farmers who have the means to prepare for *water rotting* will do so, they will not only find it profitable to themselves, but it will be of infinite advantage to those who raise *dew rotted* hemp, at least until they learn to prepare it better.

From what I have written in these various articles, it is very plainly to be observed, that there is too great a quantity of *poor* dew rotted hemp raised, and that the quantity acts as a load, or *pressure* upon the price, until the article has nearly uniformly to keep at an unnaturally low price.

What we need, then, to rid this infant staple of the load that has well nigh crushed it, is a greater care in the preparation of the dew rotted for market, and that some of our most wealthy hemp raisers should turn their attention to water rotting.

As the quality and the standard of our hemp is raised, we will see the price gradually rise with it. Is not this an object worthy the thought and consideration of our farmers and our wise legislators? This is a subject of no ephemeral or limited importance, for its importance is commensurate with the bounds of the Union, and the interst we feel in it should be as lasting as our rich alluvial lands.

The average quality of the hemp now being broken, will have much effect upon the price the comming season, and yet a greater effect, I think, upon the price the season following. It, then, behooves our farmers and our Legislature to take time by the forelock and act immediately for the interest of the article—the farmer by breaking and dressing it nicely, and the Legislature by passing a judicious law for the inspection and baling of it.

Does not every one know that the culture and preparation of hemp, as well as the machinery for breaking and dressing it, is behind every thing else in this enlightened day, and have we no pride of State to foster and encourage an article that should be its wealth? I am sure that our State is not devoid of this pride; and now that the subject is fully up for consideration and action, I shall hope to see every one do his duty.

When this shall be done, what a proud day will it be for our State. We shall then see those thousands, if not millions, of acres of fine hemp lands, that now lie through the State in their primeval grandeur, subjected to the plough and the harrow, until they shall be made to yield a golden harvest.

Article III.

THE COTTON TRADE FROM 1825 TO 1850.*

(From the Merchants' Magazine.)

Instead of our annual review of the cotton trade for a single year, we propose to extend our examinations back to a longer period. For this purpose we have collected in our statistical tables, the production, consumption, stocks, and prices of cotton for each year from 1840 to 1850, and for the more important particulars of the trade, we have gone back as far as 1825. This period of 25 years we have divided into intervals of five years, and given the average for each, noting the rate of increase or decrease for each country separately, By taking average results we get clear of the fluctuations arising from short crops and other disturbing causes, and are able to observe the general progress free from those temporary variations which prevent us judging acurately the real changes that are taking place. In this review we shall see a very prominent place assigned to our country. The United States is now not only the largest producer, but the largest consumer of cotton; our production has advanced with such rapid strides that we have distanced all competitors: the cotton goods worn by our people exceed now the amount used by Great Britain and all her dependencies in the four quarters of the globe; and the demands of our manufactories have increased with much greater rapidity than those of any country in the world.

In the Table of supplies (table I. at the end of this article) we may observe that while other countries have been nearly stationary our production has advanced with great rapidity. In twenty years our average crop has increased from 848,000 bales to 2,351,000, or nearly three hundred p. ct. If the period of twenty-five years, from 1825 to 1850, be divided into five equal intervals, the increase for each will be found to be 27, 37, 38, and 15 per cent. In the same time, the production of all other countries has only risen from 383,000 to 440,000 bales, having absolutely declined in the last five years, over 16 per cent. In the first period of five years, the crop of the United States constituted 68 per cent. of the whole; in the second, 74; in the third, 77; in the fourth, 80; and in the fith, 85 per cent of the whole. As our bags have increased very

* The following article relating to the cotton trade will be found interesting and useful to men engaged in every branch of business; for so important is the article of cotton in the commerce of the civilized world that the value of almost every other commodity, at least in the United States, is affected by any material change in its price. We have not the means at hand to enable us to decide upon the accuracy of the facts and figures of the learned author of this treatise, but we are persuaded that they are sufficiently near the truth for all practical purposes.

We need not invoke the spirit of prophecy to enable us to predict how long it will be ere the population of the United States will consume an amount of cotton equal to that grown within our territory; for the simple rules of arithmetic, applied to the facts before us, will lead to conclusions sufficiently accurate to guide the statesman and political economist. It is possible that in this age of discovery a substitute may be found for cotton, at least in part, but should no such discovery be made, many now living will witness the importation of raw cotton into this country. Editors.

much in weight, and are now much larger than those of other countries, our advance has been still greater, and our rank still higher, than these figures indicate.

If the table of consumption (table II.) be examined, it will appear that our progress is none the less rapid in comparison with other countries. In the same twenty years, the deliveries to our manufactories have advanced 325 per cent, viz: from 127,000 bales to 539,000; while in the same time the advance of Great Britain has been only 125 per cent, viz: from 653,000 bales to 1,472,000. In each one of these periods, our rate of progress has been more than twice as rapid as hers; and though the absolute amount of our consumption is yet far below that consumed by the English manufacturers, yet in the last five years, our increase has been 176,000 bales, while theirs has been only 180,000. At present our consumption is 37 per cent of the English, while twenty years ago, it was only 19 per cent.

France, during all this period, has remained nearly stationary. Twenty years ago her consumption was 257,000 bales—now it is only 363,000. In the last five years she has gone backwards, the decline having amounted to 58,000 bales. From 1825 to 1830 the deliveries to her manufactories were double those of the United States, now they are 33 per cent less than ours. Her rank compared with Great Britain, and with nearly every other country in Europe, has also declined.

In Spain, Belgium, Holland, Germany, and Russia, the increase has been nearly as rapid as in the United States. In the last five years their advance (table III.) has been 46 per cent, ours 49 per cent. Their rank in the cotton consuming countries is yet low, but their rapid progress will soon bring them to a more important position. At present their consumption is 34 per cent of that of Great Britain, and the time is not far distant when, taken together, they will equal her.

Twenty years ago, the comparative rank of the United States, Great Britain, France, and the rest of the continent, was in proportion to the numbers 11, 55, 22, and 12; in the last five years, the per centage of each has been 19, 51, 13, and 17. If France be left out of the comparison, the rank of each twenty years ago, was as 13, 70, and 17; now it is as 21, 59, and 20.

Although Great Britain requires for her manufactories more than half of all the cotton worked up in Europe and America, the amount actually used by her people, including all that is exported to India, British America, Australia, and all the colonial dependencies of Great Britain, is less than the amount used in the United States. This has been shown to be true for the last four years, and the present year, although it exhibits an apparent decline in our home consumption, forms no exception to this result. The enlarged imports of cotton goods into our seaports, compensate in part for the falling off in the wants of our factories.

If we compare the progress in the demand and supply, it will be seen that during the last five years the consumption has increased much faster than the production—the one having advanced nineteen per cent, and the other only nine. This might be inferred from the decline in the stocks, but it will be more satisfactory to consider the average production and consumption of the last ten years. The average amount taken by the manufacturers from 1840 to 1845 was 2,414,000 bales, and from 1845 to 1850, 2,869,000 bales, showing an increase of 455,000 bales; while the supply advanced from 2,561,000 bales to 2,791,000, with an increase of only 230,000 bales. When it is remembered that the last period embraces the year 1847, when from the revolutions of Europe, the consumption declined over 600 bales, and the years 1845 and 1849, when the American crop so far exceeded its usual average, this result will be more striking and important. The table of stocks (table IV.) confirms and establishes this same result. At the end of 1844 the cotton on hand in Europe was 1,101,000 bales; at the end of 1849 it was only 646,000 bales.

It may further be observed that the increase in the supply during the last five years has been slower than the natural increase of laborers. The advance in the one has been only 9 per cent, and in the other 12 or 13, As many new hands have been brought to the Southern States during this period, the rate of increase in the working force of the cotton growing States has been still greater than 12 or 13 per cent. This excess has occurred at no former period. From 1825 to 1850 the increments for each period of five years have been 18, 32, 33, and 9 per cent—always above the increments of population, except in the last interval. It follows from this that labor and capital have found other modes of employment more attractive and profitable than the raising of cotton. It is well known that this has been to some extent true in the United States, but it has been more evident and striking in India and Brazil. In these countries the crop has declined 16 per cent in the last five years. From Brazil it has declined regularly for the last twenty years, and the recent advance in coffee will tend to divert still more labor from the production of cotton. The abolition of the discriminating duty in favor of East India cotton by Sir Robert Peel, and the very low prices which have recently prevailed, have not only stopped any increase in the imports of Surat and Madras, but turned the current in the opposite direction. The advance in the fifteen years before 1845 was 10, 80, and 60 per cent in each interval of five years, but from 1845 to 1850 the decline has been 24 per cent.

It may fairly be deduced from this that the prices of the last five years have not afforded sufficient encouragement to production, and that the planters may now look for a permanent improvement in prices. The table of prices (table V.) shows that for the last five years the average price at the sea-ports of the United States

has been seven cents and three mills, and it may be expected with confidence that they will not rule so low hereafter—that the average rates will not merely experience a temporary rise, as if caused by the short crop and the small stocks of the present year, but a permanent and continued advance.

The table of stocks (table IV.) represents the amounts on hand in the sea-ports of Europe continually increasing from 1840 to 1845, while during the four years ending in 1849, they have been nearly stationary. Comparing them with the wants of the manufacturers, as is done in the column which contains the number of weeks that the stocks would supply the consumption of the factories, the supply was a trifle lower at the close of 1849, after the receipt of the largest crop ever brought to market, than it had been during the last ten years. The number of bales was a little greater than at the close of 1848, but the time this stock would supply the wants of the manufacturers was a little less.

After this review of the history of the trade in cotton for the last ten years, if we remember that the production of 1850 has been much below the average of the last five years, and that the prospects of the next year's crop are but little better, it is evident that the present advance in cotton is founded on no speculative basis, but on the unchangeable laws of supply and demand. Two short crops are succeeding each other, while the stocks on hand are very much reduced. To this it may be added, that every thing is favorable to a large consumption. Peace every where prevails except in the unimportant Duchies of Schleswig-Holstein. Money is abundant and the currency everywhere undisturbed. Food is very cheap. The present harvest of Europe as well as the last, is much above the average. Thus, while stocks are low, and the supply small, the demand is large. Prices, therefore, must maintain a high level, unless commotions in France or some unforseen event of commanding importance interfere with the regular operations of commerce.

In considering the supply and demand of the coming year, we must therefore, base all our estimates on high prices. The receipts from India and Brazil, and the consumption in Europe and America, will all be affected by this fact. If the advance were slight, it would not experience any sensible check, but when the price has risen to its present rate, (13½ cents for middling fair, Savannah, October 23d,) an advance of 85 per cent over the average of the last five years, the amount purchased, even in our country, may be expected to decline.

The supply for 1851 will probably exceed that of 1850, not only from the United States, but from India and Brazil. The past season here has been unfavorable for the growth of cotton, but its disasters, especially in the west, have not been as severe as in the preceding year. In South Carolina and Georgia there will be a decided decline. The late cold spring, and the long drought in

June and July, left the plant small and the bolls few and scattering. The severe storm on the 24th of August blew out on the ground much open cotton, and prostrated and twisted the stalks so much that there has been no late crop of forms to mature in October. September was a beautiful season for gathering and so was much of October. There are some plantations where the crop is very fine. The hot summer favored a rapid growth, and repaired in part the injury done by a late spring. The general drought was, at some places, relieved by local showers, which brought out some superior crops. The amount of land planted was greater than ever. The receipts at Charleston and Savannah will also be increased by the extension of the Georgia Railroad to the Tennessee River. Were it not for this last cause a falling off of 100,000 bales might be anticipated. With this the deficiency will not probably exceed 70,000 or 80,000, and the receipts of these two ports may be expected to reach 650,000 bales. From Alabama the reports have not been so disastrous. The spring was late and the stand poor, but the dry summer prevented the ravages of the worm which had done so much damage the preceding year. The river floods had also done harm last season, and these they have escaped. The prairie lands have not suffered so much with rust as before. On the Tombigbee and also on the Black Warrior, the prospects of the planters are very much above those of last year. On the Alabama, the promise is about the same as last year, Still the disasters have been severe, and the crop will be below an average. An increase of 90,000 or 100,000 bales in the receipts at Mobile, including the Montgomery shipments to New Orleans, may with confidence be anticipated. From Florida a slight increase may be looked for. The amount of land planted has been considerably enlarged, and the drought has not been as general as in the eastern part of the cotton region. At New Orleans and in Texas a gain may be looked for. The failure last year was so great that it is almost impossible to expect a like deficiency again. From Louisiana, Arkansas and the greater part of Mississippi, the reports have been better than last year. The early frost of October 6th injured not a little of the cotton as far north as Memphis, but in general even in Tennessee the plant remained green and flourishing, till the general frost at the close of the month. The production of Tennessee and North Alabama will fall below that of last year, and a portion of this will not reach New Orleans. The crop was every where backward, but the hot, dry summer helped to repair this damage, and by keeping off the caterpillar and boll worm permitted the forms to mature. The severe storms that did so much harm in Florida and the Atlantic States did not extend so far to the west. The season for gathering has been very fine, and the time of frost late enough to mature nearly every boll that could make cotton. The average receipts at New Orleans for four years past have been 943,000 bales, and this

period includes two short and two full crops. For the present year I would estimate them at 850,000 bales. Combining these estimates, the whole supply from the United States will amount to 2,200,000 bales, (see table VI.) which is about 100,000 in advance of the last crop, but considerably below the average of the last five years.

The receipts from India have increased very much during the present year under the stimulus of high prices, and they are destined to advance still more for the coming season. The purchases now making in Bombay for the English market are reported to be large, and when the new crop begins to arrive at the sea-ports, the current will turn still more strongly towards England. Not only is their production enlarged by high prices in Europe, but a larger portion of the crop is diverted from China, and from domestic use for the western market. The average imports into Great Britain for the last three years have been 211,000 bales, but for the first nine months of this year they have reached 128,000 bales for Liverpool alone, and for the whole year, for all the ports, they will probably reach 300,000 bales. For 1851 not less than 325,000 bales may be anticipated. This is higher, much higher than any former year. The year 1841 was the largest before 1850, and then the amount was 275,000 bales. The high prices that are now prevailing, and that are likely to prevail for the present season, authorize us to expect an increase even over the present year. (Table (VII.)

From Brazil, Egypt, and other places, an advance over the usual average may also be looked for. The average imports into England from 1845 to 1849 were 175,000 bales, but for the present year the amount will exceed 260,000 bales, and for 1851 will be still larger. (Table VIII.) If we estimate them at 275,000, the whole supply from all the sources (table IX.) will reach 2,800,000 bales.

In reference to the consumption we may remark that the purchases for our home manufactories have declined during the present year over 30,000 bales. The high price of the raw material, the low duties on foreign goods, and the immense imports of cotton fabrics from England, have caused this retrograde movement. In 1849 there was a falling off of 14,000 bales, so that our consumption is now 44,000 bales below that of 1848. Doubtless the stocks in the hands of the manufacturers are very small, and a slight advance in goods would set all the mills at work again. The universal prosperity of the country forbids us to expect the extension, or even the continuance of this depression. For 1851 I would estimate the demand at 500,000 bales, which is 11,000 above the consumption of the present year, (table X.) and 13,000 below the average of the last three.

In Great Britain the falling off in the purchases of the manufacturers have been very slight, (table XI.) and as the reported pur-

chases last year were 80,000 or 90,000 bales above the actual deliveries to the manufacturers, the real deficiency is less than the apparent. For the present year the consumption in Great Britain will not be below 1,500,000 bales against 1,588,000 in 1849, and 1,491,000 in 1848. Everything has been favorable to a large consumption except the price of the raw material. Money has been abundant—food of all kinds cheap—and labor well rewarded. These elements of prosperity have not been confined to Great Britain, and therefore, her exports of cotton goods have been unprecedently large. The home and foreign demand being both good, the factories have run full time in spite of the high price of cotton. This never occurred before, and cannot be expected again with any considerable confidence. At every former period an advance in the raw material has checked the demands of the factories, and lessened the purchases of the consumers. For the coming year everything is fully as favorable as the last; and if these favorable tendencies have counteracted the tendency of high prices in the raw material, it will be proper to expect the same for 1851 as for 1850. We may, therefore, set down 1,500,000 bales as the probable English consumption for the next year.

In France there has been a decided decline (table XII.) in the deliveries to the manufacturers. Our exports have fallen from 368,000 bales to 290,000, and the stocks on hand on the 1st of October were almost exactly the same as last year. The purchases at Havre for the first nine months of the present year have been 249,000 bales, against 290,000 in 1849. From these figures we cannot estimate the consumption of American cotton for the present year higher than 300,000 bales, against 351,000 for 1849. No advance on this can be expected for the next year, nor is there any reason to anticipate any appreciable decline.

For the rest of Europe, we have the exports from the United States for the present year 194,000 bales, and the exports from Liverpool up to October 11th, 193,000 bales. The whole English exports of 1849 were 254,000 bales, and as their amount on October 12th was 21,000 more this year than last, the whole exports for the year from all the ports will probably reach 275,000 bales, making the total supply from these two countries of 469,000 bales. As the stocks on hand on the continent last year were very low, it is impossible to reduce them much lower. They are now, however, at several ports, lower than last year, so that the consumption will probably exceed 469,000 bales. As this is a decline of over 100,000 bales from 1849, it is not to be expected that so low a limit can be reached for the year 1851. Heretofore their progress has been forward and rapid, and were it not for high prices this would continue. If we estimate their wants for 1851 at 500,000 bales, we have the total consumption (table XIII.) at 2,800,000 bales—the same as the supply. As the stocks are now much lower than last year (table XIV.) and as they were then very low, they

low, they will bear no farther reduction without a material advance in prices. On the contrary, any decline in price would immediately permit the consumption to expand, not only in France and the rest of the continent, but even in England. We may expect, therefore, that the present high range of prices will be maintained.

The review that has been taken of the supply and demand shows that the present advance in cotton is the result of no speculative movement, but that it is based on the imutable laws of trade. The long prevalence of low prices has stimulated consumption and diminished production, until the stocks on hand have fallen to an extremely low limit. Exactly at this point an unfavorable season has lessened the crop, and an abundant harvest and every other element of general prosperity, has encouraged the demand. We congratulate the planters on the handsome returns they are receiving for their crops, and we may extend our congratulations to the whole country, for what benefits them is a benefit to all.

TABLE I.

SUPPLY OF COTTON.—IN THOUSAND BALES.

	U. States crop brought to the sea-ports.....	U. States consumed in the South.....	Total U. States crop.....	East India imports into G. Britain.....	Brazil, &c., imports into G. Britain.....	Brazil, &c., imports into other places.....	Total besides U. States...	Total of all kinds....
1840.....	2,178*n*	50	2,228	216*h*	146*h*	111	473*c*	2,701
1841.....	1,635*n*	55	1,690	275*a*	166*a*	128	569*c*	2,259
1842.....	1,684*n*	55	1,739	255*h*	124*h*	166	545*c*	2,284
1843.....	2,379*n*	60	2,439	182*h*	165*h*	176	523*c*	2,962
1844.....	2,030*n*	60	2,090	234*a*	197*h*	80	511*c*	2,601
1845.....	2,395*n*	65	2,460	155*h*	201*h*	105	561*c*	2,921
1846.....	2,101*n*	70	2,171	95*b*	155*a*	69	419*c*	2,490
1847.....	1,779*n*	80	1,859	224*a*	135*a*	122	481*c*	2,340
1848.....	2,348*n*	90	2,438	228*h*	137*h*	36	401*c*	2,839
1849.....	2,729*n*	100	2,829	182*h*	245*h*	111	538*c*	3,367
Av. from 1825 to 1830....	838*n*	10	848	73*h*	211*h*	99	583	1,231
" 1830 to 1835....	1,055*n*	20	1,075	81*h*	186*h*	108	375	1.459
" 1835 to 1840....	1,440*n*	35	1,475	144*h*	196*h*	104	444	1,919
" 1840 to 1845....	1,981*n*	56	2,037	232*a*	160*a*	132	524*c*	2,561
" 1845 to 1850....	2,270*n*	81	2,351	177*a*	175*a*	88	540*c*	2,791
Inc. p. ct. in 20 years....	171		177	142	17		15	117
" 15 years....	115		119	118	8		17	92
" 10 years....	58		59	23	11		1—	45
" 5 years....	15		15	24	9—		16	9

TABLE II.

CONSUMPTION OF UNITED STATES, GREAT BRITAIN, FRANCE, AND OF EUROPE AND AMERICA—IN THOUSAND BALES.

	U. States north of Richmond.	Total for U. S.	Total for G. Britain.	U. States cotton in France.	Total for France.	Total for these three.	Total for Europe & America.
1840	295*n*	345	1,271*a*	374	440*a*	2,056	2,370
1841	297*n*	352	1,158*a*	368	442*a*	1,932	2,252
1842	268*n*	323	1,027*a*	364*a*	442*a*	1,972	2,310
1843	325*n*	385	1,385*a*	351*a*	409*a*	2,179	2,573
1844	347*n*	407	1,438*a*	335*a*	392*a*	2,237	2,564
1845	389*n*	454	1,574*a*	351*a*	419*a*	2,447	2,918
1846	423*n*	493	1,574*a*	360*a*	403*c*	2,470	2,968
1847	428*n*	508	1,131*a*	252	293*c*	1,932	2,296
1848	532*n*	622	1,491*a*	276	303*c*	2,416	2,901
1849	518*n*	618	1,588*a*	351	399*c*	2,605	3,264
Av. frm 1825 to 1830	117*n*	127	653*h*		257	1,037	1,187
" 1830 to 1835	175*n*	195	876*h*		269	1,340	1,540
" 1835 to 1840	240*n*	275	1,069*h*		349	1,693	1,943
" 1840 to 1845	307*n*	363	1,292*a*		421	2,076	2,414
" 1845 to 1850	458*n*	539	1,472*a*		363	2,347	2,869
Inc. p. ct. in 20 years	290	325	125		41	129	142
" 15 years	161	176	68		35	77	86
" 10 years	91	96	38		4	40	48
" 5 years	50	49	14		14-	14	19

TABLE III.

CONSUMPTION OF EUROPE AND AMERICA, OMITTING ENGLAND, FRANCE, AND THE UNITED STATES—IN THOUSAND BALES.

	Exports from U. States.	Exports from G. Britain.	Direct imp's from Egypt.	Stock, January 1.	Stock Dec. 31.	Consumption.
1840	182*m*	123*a*	49	72	112	314
1841	106*m*	116*a*	74	112	88	320
1842	132*m*	138*a*	88	88	108	338
1843	194*m*	119*a*	118	108	145	394
1844	144*m*	141*a*	23	145	126	237
1845	285*m*	122*a*	37	126	99	471
1846	205*m*	194*a*	26	99	26	498
1847	169*m*	215*a*	81	26	87	404
1848	255*n*	192*a*	9	87	58	485
1849	322*n*	254*a*	63	58	38	659
Average from 1840 to '45						338
" 1845 to '50						495
Increase per cent in five years						46

TABLE IV.

STOCKS, 31ST OF DECEMBER—IN THOUSAND BALES.

	Liverpool	G. Britain	Week's consumption in G. Britain	Havre	France	Rest of the continent	Whole of Europe	Week's consumption
1840	366*g*	464*g*	18	80*d*	97*d*	112	673	17
1841	430*g*	538*g*	24	90*d*	135*d*	88	761	21
1842	457*g*	561*g*	24	109*a*	138*d*	108	807	21
1843	654*g*	786*g*	29	101*a*	125*d*	145	1,056	25
1844	745*g*	897*a*	32	53*a*	78*d*	126	1,101	26
1845	885*g*	1,057*a*	35	52*a*	65*a*	99	1,221	26
1846	439*g*	547*a*	18	25*a*	47*a*	26	620	13
1847	364*g*	451*a*	16	43*a*	53*a*	88	591	17
1848	393*h*	498*a*	17	20	31*a*	57	587	13
1849	468*h*	559*a*	18	38*a*	49*a*	38	646	13

TABLE V.

AMOUNT, VALUE, AND PRICES OF AMERICAN COTTON.

	Exports in millions of pounds	Value in millions of dollars	Price of exports	Whole crop of U. States.	Value of U. States	Liverpool prices of Uplds in pence.
1840	744*r*	64*r*	8.6	891	77	6*d*
1841	530*r*	54*r*	10.2	684	70	6 1/4*d*
1842	577*r*	40*r*	8.1	704	58	5 3/4*d*
1843	817*r*	49*r*	6.0	988	59	4 5/8*d*
1844	664*r*	54*r*	8.1	857	69	4 7/8*d*
1845	873*r*	52*r*	6.0	1,009	61	4 3/8*d*
1846	548*r*	43*r*	7.9	901	71	4 7/8*d*
1847	527*r*	53*r*	10.1	771	78	6 3/4*d*
1848	814*r*	62*r*	7.6	1,011	77	4 1/4*d*
1849	1,027*r*	66*r*	6.5	1,174	76	5 1/8*d*
Average from 1825 to 1830	219*r*	28*r*	12.8	288	37	7 1/4*d*
" 1830 to 1835	312*r*	34*r*	10.9	387	42	7 1/4*d*
" 1835 to 1840	446*r*	64*r*	14.4	560	81	8 1/4*d*
" 1840 to 1845	666*r*	54*r*	8.1	825	67	5 1/2*d*
" 1845 to 1850	754*r*	55*r*	7.3	972	71	5 7/8*d*

TABLE VI.

UNITED STATES CROP.

	Receipts.			Estimate.
	1848.	1849.	1850.	1851.
Texas bales	40,000	39,000	31,000	50,000
New Orleans	1,191,000	1,094,000	782,000	850,000
Mobile	436,000	519,000	351,000	440,000
Florida	154,000	200,000	181,000	190,000
Georgia	255,000	391,000	344,000	300,000
South Carolina	262,000	458,000	384,000	350,000
Other places	10,000	28,000	24,000	20,000
Total	2,348,000	2,729,000	2,097,000	2,200,000

TABLE VII.

ENGLISH IMPORTS FROM EAST INDIES.

	Imports.	Remarks.
1835 to 1840, average bales	144,000	High prices.
1840 to 1845, "	232,000	Chinese war.
1845 to 1850, "	177,000	Peace and low prices.
1848, October 6, Liverpool	93,000	Moderate prices.
1849, October 5, "	69,000	Low prices.
1850, October 4,	128,000	High prices.
1848, whole year	228,000	Moderate prices.
1849, "	182,000	Low prices.
1850, estimate for whole year	300,000	High prices.
1851, " "	325,000	High prices.

TABLE VIII.

ENGLISH IMPORTS FROM BRAZIL, EGYPT, ETC.

Year.	Ab't the 1st October, Liverpool.	Whole year for Great Britain.	Year.	Ab't the 1st October, Liverpool.	Whole year for Great Britain.
1846 bales	121,000	155,000	1849 bales	178,000	245,000
1847	75,000	135,000	1850	203,000	260,000
1848	94,000	137,000	1851	.....	275,000

TABLE IX.

SUPPLY OF COTTON.

	1849.	1850.	1851.
Crop of the United States bales	2,729,000	2,097,000	2,200,000
English imports from East Indies	182,000	300,000	325,000
English imports from other places	245,000	270,000	275,000
Total from these sources	3,156,000	2,667,000	2,800,000

TABLE X.

UNITED STATES CONSUMPTION.

Years.	Amount consumed.	Average for three years.	Increase per cent per annum.	Increase per cent for three years.
1846	423,000	386,000	9.0	23
1847	428,000	413,000	7.0	32
1848	532,000	461,000	11.5	30
1849	518,000	493,000	7.0	28
1850	488,000	515,000	4.0	24

TABLE XI.

DELIVERIES TO THE TRADE AT LIVERPOOL.

	1849.	Consumption each week.	1850.	Consumption each week.
March 8 ... bales	324,000	36,000	227,000	25,222
April 12	433,000	30,929	338,000	24,143
May 10	562,000	31,222	501,000	27,833
June 21	748,000	31,167	672,000	28,000
July 6	835,000	30,926	742,000	28,222
August 9	1,037,000	32,206	907,000	28,942
September 6	1,141,000	31,694	981,000	28,029
October 4	1,220,000	30,500	1,086,000	27,150
October 11	1,287,000	31,390	1,116,000	27,219

TABLE XII.

DELIVERIES TO THE TRADE AT HAVRE.

	1849.	Consumption each month.	1850.	Consumption each month.
May 1 ... bales	120,141	30,085	103,428	26,482
July 1	193,971	32,328	167,653	27,942
August 1	243,040	34,720	200,650	25,664
September 1	279,541	36,442	332,190	28,024
October 1	290,585	36,328	249,797	27,523

TABLE XIII.

CONSUMPTION.

	1849.	1850.	1851.
Great Britain, of all kinds ... bales	1,588,000	1,500,000	1,500,000
France, of American cotton	351,000	300,000	300,000
The rest of the continent	596,000	470,000	500,000
Total	2,535,000	2,270,000	2,300,000

TABLE XIV.

STOCKS AT RECENT DATES.

	1849.	1850.
Liverpool, October 9 ... bales	582,000	482,000
Havre, October 9	46,000	48,000
United States, September 1	155,000	168,000
Hamburg, October 1	5,000	2,000
Total	788,000	698,000

[*n*] New York Shipping and Commercial list. [*h*] Circular of George Holt and Company. [*a*] Average of several authorities. [*b*] Circular of Daniel Buchanan and Company. [*c*] Circular of Collman and Stollerfoht. [*m*] Hunt's Merchants' Magazine. [*r*] Report of the Secretary of the Treasury. [*g*] Burn's Commercial Glance. [*d*] Circular of Messrs. Todd, Jackson and Company. [—] Minus, after any number, signifies decrease.

ARTICLE IV.

ON ANHYDROUS STEAM, AND THE PREVENTION OF BOILER EXPLOSION. BY DR. HAYCRAFT, GREENWICH.*

From the London Mechanics' Magazine.

In the London Mechanics' Magazine, Mr. Frost, of New York, has with much talent developed his views on dry or anhydrous steam, which, on the supposition of its having its own atomic constitution, he denominates *stame*. He has given experiments which open a vast field for improvement, and his conclusions lead us to believe that the power of the steam engine may be prodigiously increased. Having, about twenty years since, entertained nearly the same views as Mr. Frost, and having abundant reason to modify them, it may not be amiss to give a historical detail of the principal facts on which those opinions were founded. It will be at least advantageous to the reader, by warning him of those errors by which I have been misled, and will at the same time open to him the right path to improvement.

Being induced by the experiments of Broughton, who supposed that steam was 10,000 times rarer than water, and also by those of Desagulier, who put it down at 14,000, I experimented by weighing steam in a copper ball, and afterwards weighing the same after having immersed it in boiling oil for some time, for the purpose of superheating and rarefying the steam. The particulars of this experiment I need not detail, as it is, I now perceive, liable to same objections as Mr. Frost's, which I will afterwards explain. The result was, that by exposing steam to the temperature of boiling oil, its specific gravity appeared to be lessened to about one-tenth; that is, it expanded to about ten times its former bulk.

Encouraged by this apparently satisfactory experiment, I had a small steam engine constructed, with a cylinder of 4 inches, and furnished with a tubular condenser, by which I could measure exactly the quantity of steam consumed. The cylinder was furnished with a jacket, which was supplied by a small high-pressure boiler.

On working the engine with ordinary steam, it required 85 revolutions to fill a given measure with the condensed steam; but on applying steam to the jacket of about 500 pounds pressure, it required 920 revolutions to fill the same measure—the engine in both instances carrying the same weight on the paul. In this experiment, which was often repeated, it appeared that dry steam, or

*We copy the following article from Appleton's Mechanics' Magazine, where we find it published without comment. We do not profess to be sufficiently acquainted with the properties of steam to decide on the correctness of the author's views; but the subject is one of no ordinary importance to every part of the civilized world; and we commend it to the consideration, especially of the Civil Engineer and all those immediately interested in the use of steam as a motive power. EDITORS.

Mr. Frost's *stame*, is ten times more economical than ordinary or hydrated steam.

Having succeeded thus far, a high-pressure engine was erected, with a 9-inch cylinder and 3 feet stroke: the cylinder was so constructed that a fire could be made round it, and at the same time the supply steam passed through tubes exposed to the heat of the furnace flues. The engine worked very well for some time, and with surprising economy of fuel; but, as might be expected, the parts exposed to high temperature gave way, and the engine became useless.

Afterwards I had a small engine, with the cylinder immersed in a mercury bath, with a metallic piston; this engine also gave great satisfaction for a time. It however occured to me one day to make a calculation of the actual working of these engines; and I found, to my astonishment, that, although my rarefied steam or "*stame*" had, as I believed, ten times the rarity of ordinary steam, yet its performance was in all these cases about equal to what it should be, supposing it to have the rarity ascribed to it by Watt—namely, 1728 times greater than that of water. On examining this subject carefully, I fortunately recollected the remarkable admission of Watt, that in his best engines there was a consumption of steam double of what was required by calculation. We have here two remarkable facts: one is, that a large engine, of Watt's best construction, consumes twice as much steam as it should by calculation; and the second is, that a small engine, carefully made, requires ten times as much as is sufficient under a different management.

This must be explained either by supposing there is some waste in the usual mode of operating with steam, or that, by superheating it, there is an absolute expansion of its volume.

To settle this latter point, the following experiment was made, which, though performed many years since, has never been published. The experiment was designed to ascertain the density of steam, but chiefly to determine what effect a superheating of it would produce.

A graduated tube was filled with mercury, the upper end being closed, and the lower immersed in a basin of mercury. Oxygen and hydrogen were introduced in the proportions which constitute water, to a certain mark which was noted. Two coated wires being introduced at the lower end, the gases were detonated, and, of course, reduced to water. The whole was placed in an oil bath, gradually heated to 210°, when steam was formed filling the tube to a point marked. On this a calculation was made which came so near 1728, the expansion assigned by Watt, that I was satisfied of its general correctness. Having ascertained this point, I proceeded to determine the other, which to me was of the greatest importance, namely, how far an additional temperatnre would expand the steam, expecting that, at all events, it would have as much

effect as is ascribed to it by Gay Lussac and Dalton, namely, as doubling the volume for every 480°. My surprise was indeed great, when I found that an increase of 10° made no perceptible difference in the volume of the steam. I then gradually raised the temperature of the oil bath to 285° without perceiving the least expansion; indeed it appeared very slightly to have contracted its bulk—arising, I suppose, from the expansion of the glass tube. I did not raise the temperature higher—my apparatus, unfortunately, not admitting of it—and I was completely satisfied that an additional temperature of 75° did not expand the steam. The experiment was several times repeated with the same result.

How can this experiment be reconciled with those of Mr. Frost, who finds that an addition of 4° doubles the volume of the steam? There is such an air of candor about Mr. Frost's communications, that I am disposed to give full credit to the facts which he details, and the only way I can think of to reconcile the discrepancy, is to suppose that some mismanagement has taken place either in his experiments or mine. On examining his apparatus, as represented in figs. 4 and 5, page 252, No. 1390, and his mode of using it, I find that the whole syphon is filled with water, which, being converted into steam at a high temperature, the superabundant water escaping, is thereby filled with *stame*. The syphon being then hermetically sealed up, was suffered to cool;—an engineer's vacuum, as he aptly terms it, is formed. Now, in this process it must be observed, that the whole interior of the syphon must be covered by very minute globules of water. The mercury is then introduced, which would fill the syphon with the exception of these minute globules, which would be every where interposed between the quicksilver and the inner surface of the tube. Then, on applying heat at the boiling point, the globules of water at the upper part of the syphon only are converted into steam; the remainder is kept in the aqueous form by the weight of the column of mercury incumbent upon it, so that it is no wonder that an addition of 4° temperature would convert some of the globules of water into steam of double the whole column. The other instruments used by Mr. Frost are still more complicated, and I fear in their use would give rise to the same errors; and, as all the experiments were conducted in nearly the same manner, the results would be similar in them all. In such experiments the utmost care should be taken to operate in perfectly dry tubes.

Having said thus much in reprehension of the mode in which Mr. Frost's experiments were conducted, I will gladly take this opportunity of acknowledging the great importance of the experiments themselves, and of the relation of the oil of turpentine and the fixed oils to minute globules of water exposed to high temperatures. His papers deserve a most attentive perusal, especially his remarks on boiler explosions, to which we shall refer.

We shall now be able to return with advantage to the fact, that

in the small engine spoken of, as an additional temperature does not expand the steam, and as when the steam was superheated the engine consumed only the quantity that it should have done by measurement, it will follow that the same engine, when it was worked with ordinary steam, and consumed ten times as much as in the former case, must have consumed ten times as much as it ought to have done by measurement. Then comes the question, What occasions the loss? The same question applies to the other case, namely, What occasions the loss of one-half of the steam, which, we have seen, was the opinion of Mr. Watt himself, in his best engines? It has been stated that Watt ascribed this loss to unavoidable leakage by the piston, &c.; bnt on consulting several engineers on the subject, it appears that no very considerable loss could happen from this cause, as he took great pains in the finishing of his cylinders and pistons. It also appears that he had at least a suspicion of the true cause, which will be hereafter explained; namely, a cooling which takes place within the cylinder. The evidence of this is, that he took great pains to prevent it by clothing the working cylinder with non-conducting substances, and even surrounding it with steam in a jacket.

While conversing with my brother on this subject, he remarked that he thought the cylinder was cooled by the evaporation which took place within it during the time of the vacuum, as the interior surface must be covered with a film of water every time the steam is admitted. The cause of the evil now appeared quite clear. The engine at first starting is, of course, colder than the steam; it therefore becomes loaded with the water; a vacuum is made in the cylinder; the water within it is rapidly converted into steam: it derives its combined caloric (1000°) from the metal of the cylinder aud piston; these are cooled down by the abstraction of as much caloric as entered into the composition of the steam thus evaporated. Again; the supply steam is admitted into the cooled cylinder, and is condensed until the apparatus is raised to its own temperature; and not till then does it begin to act. Hence arises a fresh deposit of water, which is again evaporated with a production of cold; and thus the process continues as long as the machine acts. And here it may be noted, that this process constantly takes place in double-acting engines, for tne vacuum process is constantly occurring either above or below the piston. On the other hand, in the bastard or Cornish engine, the vacuum takes place alternately, and only during one-half of the time the machine is in action. This may well account for the general economy of this machine. In addition to which, the adaptation of the stam-jacket —a fact now ascertained—will, as Mr. Frost observes, explain in part their vast superiority. The clothing of the boilers and steam pipes, and of the cylinder, together with the management of the furnaces, may also be considered subsidiary to their effect. Having thus ascertained the cause of the great waste of steam, it now

became the question, How was it to be remedied? It was evident the plans hitherto pursued would not be practicable. It would be impossible to surround the cylinder with steam of the pressure of 500 lbs.; and I had ascertained that less would not effect the object even on so small a scale. Also, I had found that passing steam through metal pipes, exposed to the action of the fire, or of heated flues, was attended with practical difficulties which were insurmountable. It then occurred to me that, as it was only required to raise the temperature of the cylinder a trifle above the condensing point, this might be effected, provided the whole of the supply steam were raised to an equal temperature, and that all uncombined water were prevented entering with it. In order to effect this, it was necessary to have a very extended surface applied to the heating steam. I found afterwards that a fagot of tubes, being surrounded by the same steam that heated the jacket, answered the purpose. This fagot, being inclosed in a portion of the steam pipe, or in the heating boiler, I called a steamer.

The apparatus was applied to an engine belonging to Mr. John Penn. This engine was employed in turning one pair of millstones, and it was ascertained, by measuring the coals and wheat, that the consumption was 3.6 lbs. coals for each bushel of wheat ground.

This, considering the smallness of the engine, and its being low pressure, is less than in any engine yet known; for even Wolf's engines on a large scale, with high-pressure and expansion cylinders, consume from 3 lbs. to 6 lbs. for each bushel. I have since ascertained by calculation that this engine expended little above 8 per cent more than it should by measurement, while even the Cornish engine expends 33 per cent more than the proper quantity.

On experimenting, however, with this engine, I found I had not produced the maximum effect. In order to explain this clearly, I will state the mode by which this was ascertained. The index of the injection valve was set to a given point; the temperature of the injection was ascertained, also that of the hot-well; the difference of these in any one experiment compared with the difference between them in another, the quantity of the injection being constant, will give exactly the comparative quantities consumed in each case. By experimenting in this way, I found that on raising the pressure of the heating boiler from 30 lbs. to 60 lbs., and even to 120 lbs. on the square inch, the temperature of the hot-well still diminished. This put me to contrive again; for it was evident that such high pressures were inadmissible, and yet I was desirous of producing, if possible, the maximum effect. A plan then occurred of a priming or seperating-box of a very simple construction, which, by giving a circular motion to the supply of steam before entering the siccator, would, by the centrifugal force acquired by the free water which always rises from the boiler, be separated and fall to the bottom of the apparatus. This priming-box was consequently applied, when I was gratified by observing its effect; for on raising

the temperature of the heating boiler from 29 lbs. to 90 lbs., no diminution of temperature took place in the hot-well. This was a full proof that the maximum power of the steam was produced. The pressure of the heating steam was afterwards diminished to 15 lbs. on the square inch, on which an increase of temperature took place in the hot-well of 5 per cent. The pressure in the supply boiler was 6 lbs., so that a difference of about 9 lbs., or about 18°, is sufficient to enable steam to produce nearly its full dynamic effect. This difference would suffice, but by increasing the surface of the tubes in the siccator, the maximum effect may be easily produced at a less temperature.

About this time the matter came under the notice of the Admiralty, and the Lords were pleased to grant a sum for experimenting on this engine. The experiments were conducted on the same plan as before, except that a dynamometer was applied, which was loaded to indicate about 18 horses power; which same power was also shown by the indicator. The experiments were under the inspection of the Comptroller and Inspector of Steam Machinery, and performed by Mr. Wright, one of the engineers of the Admiralty. The experiments were comparative, and showed the expenditure of steam under equal loads; first of the engine without steam in the jacket, then with ordinary steam in the jacket, and lastly, with the siccator, &c., as above described, added to the engine. The temperature given to the injection water being ascertained, and the power being inversely as these quantities, it appears that the apparatus produces a saving of 25 per cent. compared with the engine without steam in the jacket.

These quantities, however, must not be considered as indicating the whole of the saving which would be produced by the application of anhydrous steam to engines in general; for this reason, that the engine on which the experiments were performed was so arranged as to produce the best possible effect without its use; for in addition to the engine being made by a first-rate engineer, there was abundant steam room in the boiler, the steam pipe was large and inclined downwards to the boiler, besides which the steam was applied to the jacket, not as is usually done, but in the same way as in the Cornish engines, or rather in a somewhat superior manner, as the cylinder cover was covered with steam, and every pains taken to insure the perfect action of the old method. On the other hand, in locomotive, or even in marine engines, where there is a confined steam space,—and especially in locomotives, in which an enormous power is forced from small boilers,—there must be a very serious loss by the use of steam hydrated in a very high degree. The value of anhydrous steam in these cases can hardly be sufficiently appreciated.

The makers of locomotives appear to be aware of this in some degree, as in the newest engines the steam room is increased by means of large steam chests, &c., as much as the confined space

will admit; but after all is done, the almost ruinous expense of repairing these machines, attests the evil effects arising from the present system. Capital would be well engaged in carrying out this plan with respect to locomotives and marine engines.

In consequence of these experiments, which were repeated in a variety of ways, a recommendation was made to apply the apparatus at the Government expense. This was about being done when its progress was arrested, in consequence of new regulations respecting experimental matters.

Another remarkable fact was observed in these experiments; namely, that with the apparatus, that is, with the use of anhydrous steam, the engine would carry above one-fourth more load, or in carrying the same load, an expansion being put into action, there appeared a saving of 59 per cent. compared with the engine working in the ordinary way.

That steam should undergo no expansion by an increase of its temperature appears somewhat anomalous; yet this may be considered as one of the interposited laws of nature, somewhat analogous to the increase of volume in water by the abstraction of caloric between the temperature of 40° and 32°. If it were not for this law, lakes and rivers would be frozen from the bottom, and a constant winter would reign even in the temperate regions: an equally good reason, or final cause, may be given why the vapor of water should not expand by an increase of temperature; namely, that earthquakes and other convulsions of nature, being probably caused by sudden evolutions of aqueous vapor occasioned by subteraneous fires; had the usual law of expansion by heat held place, and, much more, had the aqueous vapor been converted into "stame," the very earth would be shattered to pieces, no rocks nor hills could withstand its force, and the world would become one mighty ruin.

There is one more interposited law of nature, which is, perhaps, as important as the two I have mentioned. In some experiments which the Royal Society of Edinburgh did me the honor of publishing, it has been shown that the air of expiration in animals contains very much less combined caloric than the air of inspiration, chiefly in consequence of the vapor of water combined with it. From this it appears that the process of evaporation which continually takes place in the lungs, instead of having a cooling effect, as in every other case, becomes actually a heating process. It appears, therefore, that had this interposited law not had existence, animal heat could not be sustained; and should this law be suspended for one hour, the consumption of carbon in the system being insufficient to maintain the animal heat, the whole animal race would sink into torpidity and death. That evaporation of water should, under any circumstances, occasion an evolution of caloric, is almost incredible, but not more so than the two interposited laws I have just mentioned.

Mr. Frost and myself, though we vary somewhat, agree in the more essential points. There is even a striking accordance between us. He finds by experiment that an addition of 4° doubles the volume, and I have shown that in an 18 horses power engine, the power is nearly doubled,—that is, 46 per cent. is added by a temperature which certainly did not exceed 4° in the cylinder. He also states, that by an addition of 440 lbs. the volume of steam heated out of contact with water is increased nearly tenfold; and I have shown that in a small engine, by the application of steam of 500 lbs., the effect of the steam was increased more than tenfold. The advantage of heating tha steam is nearly the same on both hypotheses. We differ chiefly in theory. Mr. Frost supposes that steam being subjected to a higher temperature, is converted into "stame" while I believe that "stame" is nothing else but pure anhydrous steam. In practice we also agree, excepting that he proposes the very same means which I used many years ago, and which were abandoned, not because they were inefficient, but because they have been superseded by more useful and practical methods.

As to the amount of advantage to be derived from the use of anhydrous steam, it will vary in each case. It would be imprudent to expect too great things, but I have shown that in a very small engine the saving was 90 per cent.; and that in an 18-horses power with abundant steam room, it would amount to 46 per cent. It is also probable that in the same kind of engine the saving will be inversely the size of the engine, in some proportion or other. Thus the diameter of the small engine compared with the other was 1 : 6, and the saving was 90 : 46—then if we suppose a 12-feet cylinder which would be six times the diameter of the 18-horses power, the saving might be lessened in the same proportion, the 90 : 46 :: 46 : 23$\frac{1}{2}$ per cent. In actual practice the saving will be very much greater, for the reasons I have before stated. I have shown in the Appendix that the proper quantity of good coal for condensing low-pressure engines is 3·29 lbs., per horses power per hour, while in practice the consumption is not less than 6 lbs. and up to 18 lbs. I have shown also that the Cornish engine, with all its vaunted powers, instead of consuming 1·47 lbs. per horses power, consumes 2·21 lbs.,—being a loss of 33 per cent; while, on the other hand, I have shown that a low-pressure engine, driving only one pair of millstones, and with the siccator, &c., consumes 3.6 lbs.' while by measurement it should consume 3.29 lbs.,—being a loss of 8.7 per cent. only. Compare this with other engines of this class, which consume from 46 to 80 per cent. more than the proper quantity.

An anhydrous cylinder is also especially favorable for working the steam expansively. The cylinder when sustained above the condensing point allows of the full effect of the expansion according to the theory of the hyperbolic curve.

I will make a few remarks on the use of the priming-box, which so materially assists in drying the steam. I have even found it very useful when used by itself. It is applied to one of the river steamers. and by repeated experiments I have found that it effected a saving of 7 per cent. The engineer told me that with this apparatus he could drive the engines for a whole week, without blowing out the boiler, and without priming the engine, while without it it was necessary to blow out twice or thrice weekly. This little apparatus, which can be applied to any engine at a small expense, deserves the especial notice of engineers. It would soon save itself by the protection it would give the cylinder, piston, and slides from dirt and scales from the boiler.

PREVENTION OF BOILER EXPLOSIONS.

We now come to the very important subject of boiler explosions. Mr. Frost has so ably explained the most frequent causes of them, that little more need be said on the subject. The fact is, that they take place not when the steam is at its full tension, as when, for example, the engine stops for a time; but after the engines have started again, and made some revolutions, and the tension of the steam is suddenly reduced. The cases of explosion usually happen when the water supply has been neglected, and a portion of the boiler not covered by the water becomes red-hot. The explanation may be as follows: the engine having stopped some time, has become cold, then, agreeable to the principle above stated, the steam on entering the cold cylinder is rapidly condensed during the several revolutions; a large quantity of steam is rapidly drawn from the boiler, the water therein being of a high temperature, and being also suddenly relieved from a considerable portion of the steam pressure, boils rapidly, throwing up priming water, which coming into contact with the red-hot plates of the boiler, a sudden evolution of steam takes place, in such quantity as to act like detonated gunpowder; so that no boiler, however strong, can resist its violence. Those who are conversant with the river steamers will have observed that, after each stopping, the engines, especially if the boilers are very foul, prime very much; that is, the noise of the ebulition water rushing into the cylinders can be distinctly heard. Now, in such a case, if the water in the boiler happens to be extremely low, there would be the utmost danger of an explosion.

Besides the obvious propriety of keeping the boilers clean and well supplied with water, it will appear quite clear that even should these precautions be omitted from carelessness, the use of anhydrous steam would inevitably secure us from such disasters, for the following reasons; and it is a fortunate circumstance that what was designed merely to save expense should also be the most efficient means of securing our safety.

Should the engines stop for any time, the cylinders being constantly maintained above the condensing point of the steam, the engine on starting would require no more steam than usual; there could be no sudden abstraction of steam from the boiler, and, in short, the whole train of causation, before described, being prevented, no explosion could ever occur. Even a common steam jacket would in some measure diminish the danger. I have never myself heard of any boiler of a steam engine having a jacket, exploding from this cause. This subject really deserves the attention of the engineers, as we have it in our power to prevent the greater number by far of these serious accidents.

Jackets have been discarded from most engines, because they have been found to produce but little saving of steam in those engines in which there is but little steam space; so that with the exception of the Cornish engine, steam engines have retrograded, as Mr. Frost says, since the time of Watt.

As a measure of safety in boilers, the use of the priming-box promises great security, because most explosions arise from priming. All boiler explosions, in fact, arising from priming, excepting those few which are occasioned by an undue proportion between the tension of the steam and the strength of the boiler, that is, by the boiler being worn out by too long use or from improper construction. This cannot happen but from the most culpable negligence. I have shown above, that by this means, a river steamer could be worked seven days instead of two, without blowing the boiler. The cause of this is, that the apparatus receives the priming on starting the engine after stopping, thus preventing it from entering into the engines. This prevents in a great degree the cooling of the cylinders, and the consequent great demand for steam, by which the boiler being partly exhausted, the priming rises in great quantities and produces the effects that have been described. This simple apparatus may be applied at a small cost, to any steam engine: it occupies a small space, and has, besides the security it affords, the advantage of saving from 7 to 10 per cent. in the fuel. This subject deserves investigation, and should these premises be correct, no engine, and especially no river steamer, where the water is constantly foul, should be unprovided with this apparatus.

The burning of locomotives, which so frequently happens, and which is attended with such enormous expense and inconvenience, arises also from priming. It is reported in the *Observer*, that six engines belonging to the Eastern Counties Railway were burnt between the 18th and the 21st of August last. The immediate cause of this mischief is a deficiency of water. But this deficiency of water is occasioned by the great quantity of priming which takes place in the engines whenever the boilers become foul. This is far more probable than that the engine-drivers neglected to provide the usual quantity of water; and it is highly probable that in these

cases the boilers had been tampered with. An efficient priming-box would have prevented these accidents.

It would certainly be desirable to construct steam engines in such a way that safety depends as little as possible on the carefulness or negligence of engine drivers and firemen. This security, I believe, is effected by the anhydrous system.

As a summary of what I have stated, it has been shown that "stame" is nothing else than pure or anhydrous steam; that steam engines consume by measurement from one third too much, as in the case of the Cornish engines, to near six times the proper quantity of coals; that this loss is occasioned by the use of hydrated steam, and by the coldness which it occasions in the cylinder; that this coldness is caused by a constant evaporation which takes place within; and also that this evaporation is prevented by a steam jacket containing steam, which shall sustain the temperature of the cylinder slightly above the condensing point, together with the use of anhydrous steam, and this may be accomplished with a great saving of fuel.

That boiler explosions arise chiefly from priming, which takes place in consequence of the cylinder becoming cold after stopping —together with a deficiency of water in the boiler, which thereby becomes red-hot; that this priming still farther cools down the cylinder, causing a still greater exhaustion of steam, and consequently a more violent ebullition, which, acting on the red-hot boiler plates, causes such a sudden and copious production of steam, that the explosion takes place; that a heated cylinder, together with a priming-box, &c., would afford perfect security against these accidents, even should the boiler become foul or deficient in water. That an efficient priming-box alone would offer a good security against boiler explosions; and, lastly, that the burning of locomotive engines arises from the same cause, and would be prevented by the same means. There are many points concerning priming, which had I space might be pointed out; such as the priming of sea-going steamers on entering fresh water, which arises from the high temperature the water acquires in consequence of its impregnation with salt. This high temperature converts the fresh water supplied into the boiler into steam too suddenly, which is also not unattended with danger.

I will just mention one fact which, although apparently insignificant, shows in a striking manner the effect that an admission of a very small quantity of water has in cooling down the cylinder. While experimenting on the engine referred to, I blew the slide case, and then remarked the effect produced on the hot-well. The difference of temperature previously was 20°, but after blowing the slide case the temperature fell 3°, showing a saving of 15 per cent. It was, to be sure, a long T slide, which would increase the quantity of the water of condensation. This shows that apparantly trivial circumstances deserve attention. I am aware of the natural

aversion which engineers have, in common with others, to new plans designed for the improvement of their own art; yet I trust some will be found who will investigate these matters, and regard their noble profession not so exclusively as men of business as to prevent them from promoting whatever may contribute to the purposes of general utility. * * * * * * *

APENDIX.

A list of different steam engines that have come under my observation, with the quantity of coals consumed per horse power per hour.

	lbs.
Cornish engine at Deptford, (see below,)	2·21
Wolf's engines at Greenwich, (ditto)	3·
High and low pressure engines at Greenwich 40-horses power	6·
Average of five pair marine engines (Tredgold) nominal	10·3
Cornmill at Deptford, 12-horses power, low pressure	14·0
Messrs. Johnson & Berry's engine at Birmingham, 8-horses power nominal	16·
Mr. Smith's engines, almost new, at Bermondsey, 5-horses power nominal	18·88

Calculation to show the quantity of Coals which should be consumed by Steam Engines per Horse Power per Hour.

Note.—The capacities of steam, of all densities, is supposed to be constant, that is, as the density. Also that a horse power is equal to 33,000 lbs. raised one foot in the minute.

One cubic inch of water=1 cubic foot of steam (Watt), of the elasticity of 15 lbs. on the square inch=144—15 lbs.=2160 lbs., which would be lifted during its formation one foot high: and if this be done in one minute of time, 2160 : 33,000 :: 1 : 15·27 cubic inches of water required in one minute, or 916·2 cubic inches required in one hour=(1 cubic foot=62·5 lbs.) 33 lbs., to which add one-fifth for friction and loss, or 6·6 lbs., total water 39·6 lbs.; and if we allow 1 lb. of coals to evaporate 8.4 water (Tredgold) the consumption of coals will be

$$\frac{39.6}{8.4}$$

or 4·71 lbs. per horse power per hour.

But if the steam work expansively, this quantity is divided by the number according to Watt's Table, which corresponds to the degree of expansion. Thus, in Cornish engines, the steam is stopped at one-eighth, and by the Table the performance is multiplied by

3.2; therefore the consumption of coals for these engines should be

$$\frac{4{\cdot}71}{3{\cdot}2} = 1{\cdot}47 \text{ lbs.}$$

per horse power per hour.

Again; in Wolf's engine, in which the expansion cylinder is four times the size of the other, and therefore, *pro tanto*, the steam is stopped ot one-fifth. This, by the Table, multiplies the performance by 2·6; therefore, take the above constant quantity 4·71 as before, and

$$\frac{4{\cdot}71}{2{\cdot}6} = 1{\cdot}81 \text{ lbs.},$$

the quantity which should be consumed by these engines; but they consume 3 lbs. per horse power per hour, and some of them twice as much.

Also in low-pressure engines, which use a slide valve. The slide stops the steam at two-thirds, which multiplies the performance by 1·43; then

$$\frac{4{\cdot}71}{1{\cdot}43} = 3{\cdot}29 \text{ lbs.},$$

which is the proper consumption for these engines; but they actually consume from 6 lbs. to nearly 19 lbs.

Calculation to show the consumption of coals in the Cornish engine at Deptford, with the steam stopping at one-eighth and using the best coals.

Engine lifts 84,000,000 lbs. of water one foot high by the consumption of 94 lbs. of coals. If we suppose this to be done in one minute of time, the number of the horses power would be

$$\frac{84{,}000{,}000}{33{,}000} = 2545;$$

and if in one hour,

$$\frac{2545}{60} = 42.45, \text{ and } \frac{94 \text{ lbs.}}{42{\cdot}45} = 2{\cdot}21 \text{ lbs.},$$

or consumption of coals per horse power per hour; but the proper quantity, as we have stated above, is 1·47 lbs.: being a loss of exactly one-third.

The only engine in which the siccator, &c., have been applied in an imperfect manner, and acting under disadvantageous circumstances, consumes 3.6 lbs., the proper quantity being, as above, 3·29 lbs., which is a loss of only 8.7 per cent. This is the nearest approximation of any engine in existence to the true theory, and far surpassing the Cornish engines in effect, especially con-

sidering the vast difference in their size, pressure of steam, and the rate of expansion.

To exceed the theory seems not to be very probable, unless it should turn out—and the possibility of which I admit—that Mr. Frost's notions concerning the expansion of steam are correct. But without this, the room for improvement is very great, so much so that it may be considered that the steam engine is still in its infancy. It requires only the due application of capital to produce effects as yet unthought of.

W. T. HAYCRAFT, M. D., &c.

COMMERCE OF ST. LOUIS.

Table showing the quantity of wheat received at St. Louis from the Missouri, Mississippi and Illinois Rivers respectively, each month, during the year 1850, taken from the clerk's books of the Millers' Exchange.—[Copied from the *Mo. Republican.*]

	Missouri River. Sacks & bbls.	Mississippi River. Sacks & bbls.	Ill. River. Sacks & bbls.
January	1,862	2,591	6,731
February	1,465	4,723	7,501
March	11,871	15,473	35,515
April	25,171	48,993	40,372
May	10,811	17,820	28,251
June	13,254	13,109	21,547
July	9,555	7,379	14,280
August	14,558	15,860	48,370
September	10,948	41,585	67,428
October	4,639	80,830	86,704
November	3,851	61,750	142,538
December	3,247	7,367	39,401
Total sacks and bbls.	111,228	277,480	538,638

COMMERCE OF ST. LOUIS.

From the Missouri Republican.

STATEMENT,

Showing the monthly arrivals of Steamboats, (exclusive of Barges, &c.) at the port of St. Louis, from New Orleans, Ohio River, Illinois River, Upper Mississippi, Missouri River, and other points, during the years 1847—'48—'49 and '50.

Month.	New Orleans.				Ohio River.				Illinois River.				Upper Mississip.				Missouri River.				Cairo.				Other points.			
	'47.	'48.	'49.	'50.	'47.	'48.	'49.	'50.	'47.	'48.	'49.	'50.	'47.	'48.	'49.	'50.	'47.	'48.	'49.	'50.	'47.	'48.	'49.	'50.	'47.	'48.	'49.	'50.
Jan.	22	29	13	18	8	11	5	12	9	26	14	12	4	24	2	—	—	1	—	1	11	13	7	13	5	16	12	6
Feb.....	15	26	32	35	16	12	18	26	8	33	19	55	8	20	4	13	1	1	3	7	10	9	5	9	6	13	17	9
March.	48	53	38	45	28	38	58	64	85	72	82	91	41	48	79	80	14	19	44	35	3	16	10	12	13	29	27	10
April ..	77	47	36	27	41	43	65	61	91	67	63	70	74	76	117	60	32	33	63	58	1	18	9	12	12	14	21	18
May....	93	22	22	20	61	37	38	47	106	82	42	69	128	67	73	76	63	38	50	57	19	7	14	6	20	36	18	21
June ...	49	30	19	24	37	44	38	52	60	53	56	83	91	75	77	78	48	39	43	42	8	13	11	8	13	16	22	17
July....	67	30	21	12	41	48	13	32	58	55	33	56	81	51	53	49	45	34	19	32	19	5	6	3	19	28	10	12
Aug....	24	26	17	23	37	55	16	28	41	71	62	75	51	75	67	48	32	40	28	45	10	16	8	3	24	27	14	33
Sept....	28	48	31	15	30	42	33	36	45	64	87	63	57	66	77	63	23	39	41	45	18	21	11	0	28	64	19	33
Oct.....	22	51	26	20	67	43	40	40	57	70	70	63	80	82	87	59	31	36	34	26	18	32	12	4	34	72	18	26
Nov....	32	49	27	36	42	48	43	65	60	63	93	98	69	66	109	81	16	42	21	32	13	16	14	1	18	38	15	18
Dec.....	23	35	31	28	22	8	39	30	38	34	65	53	33	47	61	28	9	5	9	10	16	28	15	4	12	43	24	12
Total...	502	426	313	303	430	429	401	493	658	690	686	788	717	697	806	635	314	327	353	390	146	194	122	75	202	396	217	215

STATEMENT,

Showing the monthly arrivals of Steamboats and Barges, Flat and Keel Boats, tonnage of Steamboats and Barges, wharfage, &c., for the years 1849—'50.

	Arrivals of steamboats and barges.		Arrivals of flat & keel boats.		Tonnage of steamboats and barges.		Wharfage.		Harbor Master's fees.		Paid into the City Treasury.	
	'49.	'50.	'49.	'50.	'49.	'50.	'49.	'50.	'49.	'50.	'49.	'50.
January ...	52	64	—	3	11,954	14,129	$597 70	$683 80	$47 81	$54 70	$530 54	$629 10
February...	98	173	—	9	23,615	37,241	1,180 75	1,825 50	106 46	146 04	1,226 44	1,679 46
March.....	358	400	26	29	75,835	81,969	3,849 75	4,091 90	307 98	327 35	3,604 37	3,764 55
April.....	388	349	27	15	85,123	79,505	4,384 65	3,865 75	350 77	309 26	4,004 23	3,554 49
May.....	262	312	8	16	62,756	71,825	3,303 30	3,566 15	264 26	285 20	2,940 12	3,280 86
June.....	264	334	11	20	58,125	72,984	2,924 25	4,048 92	231 56	232 01	2,663 04	3,839 71
July.....	157	218	7	3	38,358	43,196	1,935 50	3,137 10	154 84	188 22	1,780 66	2,948 88
August.....	213	276	12	0	43,323	51,789	2,182 15	3,518 87	172 75	211 13	1,986 70	3,307 74
September.	312	259	7	3	60,865	54,610	3,052 75	3,870 48	240 48	232 23	2,766 77	3,638 25
October....	287	274	3	1	57,120	58,268	2,859 50	4,167 15	228 76	250 03	2,630 74	3,917 12
November..	336	412	46	13	61,784	82,980	3,187 70	5,718 46	254 17	343 11	2,922 98	5,375 35
December..	248	168	19	3	55,034	34,756	2,788 20	2,601 00	215 68	156 06	2,474 92	2,444 94
Total 1849	2975		166		633,892		$32,246 29		$2,575 62		$29,531 51	
Total 1850		3239		115		681,252		$41,095 08		$2,735 43		$38,382 44

From the list of steamboats published in the Mo. Republican it appears that 245 different steamboats arrived in the port of St. Louis during the year 1850. The aggregate tonnage of these amounted to 59,311; averaging a fraction over 242 tons each. Only 12 of the whole number exceeded 500 tons burthen.

The following are the largest on the list: St. Louis, 938 tons; Sultana, 924 do.; Missouri, 886 do.; Autocrat, 847 do.; Uncle Sam, 741 do.; Alex. Scott, 710 do.; Grand Turk, 689 do.; and Atlantic 667 tons.

LUMBER TRADE OF ST. LOUIS.

From the Mo. Republican.

From the report of the Lumber Master to the City Register, it appears that the following amounts of lumber, shingles, laths and staves, were received at the wharf during the year 1850:

Month.	Lumber.	Shingles.	Laths.	Staves.
January.....	———	———	———	———
February.....	128,980	———	———	1,500
March.....	354,888	———	———	———
April.....	1,138,498	100,000	———	56,800
May.....	691,209	———	———	———
June.....	1,079,100	650,000	170,000	21,321
July.....	1,142,090	265,000	———	120,195
August.....	1,154,100	1,555,000	———	176,971
September.....	1,448,100	724.000	———	116,000
October.....	586,200	500,000	———	132,246
November.....	548,900	432,000	113,000	154,000
December.....	325,829	90,000	———	28,000
Total.....	8,597,894	4,316,000	283,000	807,033

Adding to the above table 6,078,205 feet of lumber, estimated by the Lumber Master not measured, and 15,600,000 feet estimated to have been cut by the city mills during the year 1850, and we have, as the total amount of lumber received from all sources during the past year, and manufactured in St. Louis, the quantity of 29,676,,099 feet.

We annex to the above statement a comparative view of the imports of lumber, shingles, and laths, by the river, for the past six years, ending December 31st. 1850:

Year.	Lumber.	Shingles.	Laths.
1845.	10,389,382 feet.	13,927,500	2,328,700
1846.	13,169,332 "	10,652,000	1,807,700
1847.	16,917,850 "	13,098,800	2,817,000
1848.	22,137,209 "	15,851,500	2,598,915
1849.	24,188,651 "	7,334,500	1,290,500
1850.	14,676,099 "	4,316,000	283,000

MANUFACTURES AND PRODUCTIVE INDUSTRY OF ST. LOUIS.

The following table showing the extent of the productive industry of the city of St. Louis purports to have been made up from the Census returns of 1850. We found the table published in the Missouri Republican of the 11th ultimo, and being satisfied that it was imperfect we intended to examine the Marshal's returns for the purpose of ascertaining whether the errors were made by the Deputy Marshal, or whether many facts had escaped the search of the individual who compiled the table. But on inquiring at the office of the clerk of the county court, where the documents are filed, we were informed that it would require perhaps two weeks labor to give them a thorough investigation; this was more time than we could devote to the subject, and, consequently, we concluded to copy the table as published by the Republican.

When we can find sufficient time we shall recur to this subject and shall publish such corrections as we may be able to make.

In regard to the following table we will merely remark, at present, that we know that many of our most important manufacturing establishments have been omitted; and we believe that in several branches of industry the number of operatives is much below the truth.

Name of Business.	Capital invested.	Hands employed. Male.	Female.	Annual product.
104 Carpenters	$150,265	557		$1,171,580
9 Stone Cutters	28,100	90		122,700
7 Shirt Manufacturers	43,000		268	43,000
106 Tailors	205,500	680	181	650,550
14 Hatters	26,700	71	16	85,150
8 Carriage Makers	56,600	138		130,000
9 Iron Foundries*	389,000	545		569,000
2 Brass Foundries	17,000	22		25,000
71 Blacksmiths	72,430	326		303,130
16 Breweries†	195,550	81		285,925
50 Cabinet Makers	72,760	195		182,800
35 Tinners & Coppersmiths	129,300	151		287,328
1 Type Foundry	51,800	10	10	150,000
10 Chandlers and lard oil Factories	99,300	126	100	498,950
8 Tent & Awning M'frs.	1,709	10		6,300
7 Rope makers‡	70,230	97		215,000
50 Bakers§	62,250	122	22	276,640
110 Boot and Shoe makers	73,975	272		402,900
5 Gunsmiths	4,800	14		10,360
1 Fire Safe manufactory	700	7		7,000
28 Painters and Glaziers	67,130	170		217,000

Name of Business.	Capital invested.	Hands employed. Male.	Female.	Annual product.
7 Bookbinders	$7,300	27		$55,300
3 Plane makers	5,300	15		48,000
3 Trunk makers	7,700	36		74,500
7 Locksmiths	3,710	13		12,638
1 Chair manufactory	1,500	5		3,500
6 Plumbers	12,500	30		65,000
5 Tobacco manufactories	23,000	66		67,000
3 Spirit Gas Distilleries	20,500	7		63,000
2 Drug & chemical fact'rs	21,000	16		45,000
1 Hominy Mill	600	2		3,600
1 Shot Factory	40,000	25		375,000
1 Bucket Factory	4,000	10		6,000
9 Tanneries	70,200	78	4	223,900
9 Sawmills‖	115,000	103		248,000
22 Milk Dairies	12,830	25		53,640
10 Upholsterers	49,966	46	112	122,800
24 Sadlers	33,916	178	6	260,850
6 Turners	2,330	8		12,800
2 Venitian Blind makers	4,000	5	3	6,500
5 Wire workers	16,800	15		26,000
1 Gold Pen maker	1,000	1		2,000
19 Flour Mills**	439,500	181		2,367,750
2 Planing Mills	17,000	35		96,000
3 Patent Medicin manuf.,	14,000	8		96,000
53 Coopers	32,485	248		288,822
2 Glass Factories	50,000	70		64,000
3 Sugar Refineries††	177,000	211		1,213,600
2 White Lead, Castor & Linseed Oil Factories,	146,000	160		600,000
4 Soda water manufact's	16,000	91		60,500
10 Confectioners	6,700	28		57,500
1 Whip maker	600	7		4,800
4 Lime Kilns	2,330	14		21,200
1 Cork manufactory	2,500	8		8,700
38 Cigar makers	20,180	92		80,276
2 Rectifiers	4,000	6		28,000
5 Machinists	30,100	100		98,000
3 Starch Factories	25,000	17		165,000
44 Brick Yards‡‡	89,000	619		301,470
6 Sausage makers	505	6		9,600
1 Cotton Yarn Factory	70,000	40	80	70,000
13 Bricklayers§§	16,500	104		104,750
2 Organ Builders	3,500	8		9,200
6 Cap Makers	6,150	11		11,900
2 Jewelers	2,100	4		5,000
3 Band Box Makers	426	7		3,700

Name of Business.	Capital invested.	Hands employed. Male.	Female.	Annual product.
3 Match Factories	$5,500	39		$16,800
49 Butchers	49,920	111		349,654
1 Gas Company	220,000	41		43,000
1 Cotton Batting factory	32,000	35		73,000
1 Fire and Water Proof Roof Manufactory	9,000	10		13,500
1 Spice Mill	14,000	12		50,000
1 Lead pipe & Sheet lead Factory	35,000	11		75,000
2 Brush Makers	2,500	20		14,500
2 Mustard Factories	1,900	3		2,100
1 Basket Maker	400	2		2,160
1 Umbrella Maker	4,000	3	2	7,500
7 Milliners	4,300	1	48	29,500
2 Oil cloth manufactories	3,000	30		30,000
2 Saw Factories	16,500	16		34,000
3 Vinegar Factories	1,450	7		12,500
2 Bellows Makers	1,500	3		32,000
8 Pork Houses‖‖	239,800	213		799,522
1 Woolen Factory¶	50,000	15	10	45,000
32 Wagon Makers	7,275	101		146,585
1 Boat (Yawl) Builder	150	1		750
2 Distillers	39,000	37		81,000
4 Piano Makers	5,500	4		8,000
1 Comb Maker	600	1		1,000
2 Nailors	300	3		2,000
1 Mill Stone manufactory	10,000	10		10,000
6 Daguerreans	8,000	8		18,000
2 Mathemat. Inst. Mak.	2,000	2		7,600
2 Edge Tool Makers	3,500	15		8,500
1 Block & Pump Maker,	8,000	17		9,000
2 Saddletree Makers	3,500	34		15,000
1 Ship (steamboat) Yard	125,000	85		150,000
Total	$4,377,711	7,321	862	$15,400,340

*6,900 tons of Iron.
†151,120 bushels of Barley.
‡830 tons of Hemp.
§33,673 barrels of Flour.
‖14,200,000 feet of Lumber.
**2,375,000 bushels of Wheat—569,300 barrels of Flour.
††1,135 tons of Sugar.
‡‡78,220,000 of Brick.
§§First Ward only.
‖‖107,800 Hogs.
¶80,000 pounds of Wool.

MORTALITY OF ST. LOUIS.

We published in the December number, 1849, a table of mortality in St. Louis, embracing the period from 1st January to 1st of October. That table was made up by ourselves from the Register's Books, but several typographical errors having occurred in the printing, we have concluded to publish it with the proper corrections in connection with the tables of mortality from October 1849 to 31st December, 1850. The continuation is taken from the Mo. Republican and may be regarded as correct; that paper having obtained the facts, as we understand, from the Register's Books.

For week ending,	Deaths in 1849.		Deaths in 1850.	
	Total.	Cholera.	Total.	Cholera.
January 8,	87	8	72	7
" 15,	68	3	44	0
" 22,	77	17	57	2
" 29,	49	5	53	1
February 5,	37	4	45	3
" 12,	65	11	37	1
" 19,	70	4	35	0
" 26,	69	0	45	1
March 5,	59	3	39	1
" 13,	64	7	36	0
" 20,	92	26	44	0
" 26,	79	25	49	0
April 2,	65	17	51	2
" 9,	74	16	55	2
" 16,	80	24	56	2
" 23,	106	27	53	2
" 30,	131	41	44	0
May, 7,	135	78	72	22
" 14,	273	185	111	33
" 21,	192	127	65	9
" 28,	186	115	57	7
June 4,	144	75	73	24
" 11,	283	191	77	13
" 18,	510	404	100	40
" 25,	763	589	144	44
July 2,	903	619	196	67
" 9,	773	591	244	83
" 16,	867	639	212	77
" 23,	442	269	391	210
" 30,	225	93	217	69
August 6,	152	85	169	25
" 13,	117	12	227	20

MORTALITY OF ST. LOUIS.—*Continued.*

For week ending,	Deaths in 1849.		Deaths in 1850.	
	Total.	Cholera.	Total.	Cholera.
August 20,.....	94	4	167	15
" 27,.....	73	3	129	7
September 3,.....	71	4	74	2
" 10,.....	66	3	84	4
" 17,.....	88	1	71	8
" 24,.....	80	5	66	2
October 1,.....	77	0	62	2
" 8,.....	69	0	59	0
" 15,.....	63	2	64	3
" 22,.....	44	0	39	8
" 29,.....	57	0	51	7
November 5,.....	53	1	49	6
" 12,.....	44	0	72	17
" 19,.....	53	0	75	11
" 26,.....	39	1	146	5
December 3,.....	47	2	38	3
" 10,.....	42	1	41	2
" 17,.....	46	2	46	2
" 24,.....	31	0	46	1
" 31,.....	36	0	47	0
Total.....	8,445	4,285	4,595	872

Since writing the leading article of this number we have met with the following observations on the culture of flax for seed, published in the Louisville Journal. The article is credited to the "Ohio Cultivator," and appears to be from the pen of a practical and experienced farmer.—We trust that the facts which it contains will encourage our agricultural readers to embark in the business of flax growing to an extent, sufficient, at least, to prove its profitableness.

ON THE CULTIVATION AND MANAGEMENT OF THE FLAX CROP, FOR SEED AND FIBER.

The extraordinary demand that has arisen for the article of flaxseed, during the past two seasons, through the multiplicity of our oil mills and the scarcity of seed in our principal markets, have influenced many farmers to think favorably of this crop who are

practically unacquainted with its most successful methods of management. Hence any information on this department of farming, that would be considered by practical men of a reliable character, must at this time be desirable. Having had much experience in the management of flax, and having cultivated some seasons as high as fifty acres and worked the whole of the fiber into a marketable article of flax and afterward into small cordage and twines, practical farmers who may have a desire of embarking in this business either for the seed alone or for the seed and fiber may put any suggestions we make to a practical test, without any apprehension of the result proving disastrous. The only motive which prompted us to prepare our thoughts and experience on this subject for the press is to enlighten public opinion on a subject that has hitherto been much neglected by those who have contributed to the agricultural literature of Ohio.

Flax requires a rich, deep, and friable soil; and one which rests on a subsoil composed mainly of a permeable clay loam is preferable to that which is more porous in its character. This applies with greater force in the latitude of Ohio then further north, for the obvious reason that the drought affects the flax crop in the lines of latitude lying between 39 and 42 degrees, to a much greater extent than between 44 and 46 degrees. The great difficulty that the flax grower will have to contend with in Ohio is the damage that the flax will be apt to sustain in average seasons by drought. By carefully observing the few hints that may be gleaned from the following remarks, the evil may in a great measure be obviated:

The great starting point is to have the natural quality of the soil in every respect right for the crop. A rich and strong loam abounding in vegetable mold and resting on a tolerably retentive clay subsoil is above all others the best suited for the production of a large average yield of seed and a uniformly strong and valuable yield of fiber. This kind of soil comprises perhaps one-fourth of the arable land of Ohio, and in the central, northern, and western portions of the State especially the suitable quality of land for this crop abundantly abounds. Indeed, almost any soil that will produce a large return of cultivated grasses, without much extra cultivation, by being brought into a perfect state of tilth, is adapted to the profitable production of flax.

The course of cultivation most likely to afford an abundant yield of seed and fiber is to break up an old sod field, one in which the cultivated grasses preponderated would be preferable, and plant it with corn, and cultivate it thoroughly, so as to destroy all weeds, and the following year sow it with flax. Corn, when properly cultivated, is the best preparatory crop for the flax that can be cultivated, with the exception of potatoes.

The proper system of culture to practice in all cases where an abundant yield of seed is desired, is to plow the land for the flax crop in the autumn, to the depth of at least six inches, and if this

has been neglected it should be done during the winter months, so as to get the benefit of the ameliorating action and influence of frost and atmosphere, by which the entire surface soil will be changed in its mechanical combinations, so as to make the roots of the plants easily accessible to the full depth of the soil. The roots of the flax plants will extend into the soil, if in a suitable state of culture, to the depth of at least one-half the length of the stems or straws. By cultivation, and other influences being equal, the stems of flax would average at least three feet in hight and hence the importance of deep cultivation for this crop. This particular feature of the business can however be best ascertained by a practical series of experiments, and in no instance will the labor and money expended in this way be found unproductive in profits to this and succeeding crops.

Where autumn or winter plowing has been adopted, the only preparation required for the seed is to plow a very light furrow, then harrow once or twice with a small-tooth harrow to level the surface and bring the whole into a perfectly fine tilth. If the soil be clody after the spring plowing and harrowing, it should be either rolled before the seed is sown or else a thick brush harrow should be employed to pulverise the surface.

The period for sowing the seed is usually protracted some weeks beyond the one which would best secure a full average crop. As seasons very much differ, no precise period can with safety be given, but experience has proved in numerous instances that a safe and unerring rule in all cases will be found in sowing the flax crop just before the forest trees put forth their leaves and when the indigenous fruit trees of the country are showing the first evidences of blossoming. Every day that the sowing is protracted beyond this point will the crop be seriously affected, especially if the season be very dry.

The quantity of seed ordinarily sown in this country is from two to four pecks per acre. A more fatal mistake than this, however, could not be made. At least two bushels of seed should be sown per acre, and on many soils from nine to ten pecks would be preferable to a less quantity per acre.

We have frequently harvested thirty bushels of flax-seed and four hundred pounds of clean scutched flax from an acre of land prepared on the foregoing principles, and the quantity of seed sown was never less than at the rate of nine pecks per acre.

Without prolonging our remarks any further at this time, we would simply say that the subject will be continued until the ground has been fully occupied, including the preparation of the fiber for market.

W. G. EDMUNDSON.

Columbus, Ohio.

NEW METHOD OF ASCENDING AND DESCENDING STEEP GRADES ON RAILROADS.

The following account of an experiment made by James S. French, near Richmond, Va., is published in the Railroad Journal of the 16th inst. We regard this improvement, should it enable locomotives with full trains to ascend grades of 200 feet to the mile, as amongst the most important that has been made since the introduction of steam as a motive power on rail-roads. It will not only lessen, in a good degree, the cost of making railways but will authorise their construction in many parts of the country where the cost of grading and tunnelling would render them unprofitable.

EDITORS W. J.

JAMES S. FRENCH'S EXPERIMENTAL RAILWAY.—Last winter the Legislature appropriated $10,000, to test the invention of Mr. French for ascending high grades on railroads. Mr. French has expended a large sum in arranging a locomotive and car for the purpose, and for laying down a railway on the opposite side of the river, a mile above Richmond. It starts from the Danville railroad, near the Spring Hill Factory, in a valley just above the "Haunted House," and runs up hills and over streams in a direction perpendicular to the river. The experiments with the railway were very interesting; though on account of some accident to the steam boxes of the locomotive, they were not as full as desirable.

For the ascending and descending of undulating surfaces, it seems clear to us that no better method can possibly be found, combining as it does many requisite qualifications, viz: despatch in the construction of roads, greater cheapness and certainty of travelling; as, by this method, the road is neither affected by frost, ice, or even grease itself, [for the latter has been tried.] On this railway the road as constructed by Mr. French is more than a third of a mile in length, on a grade of 200 feet to the mile. The ends of the sills are cut off square with the string pieces; the rail, six inches wide, and three-fourths of an inch thick, is placed upon the string pieces, and extends outwards two and a half inches, thus affording an under surface against which a pair of rollers [the simple principle of the whole invention] are pressed. These rollers or wheels are suspended from the engine, a little in advance of the driving wheels, and are pressed against the extended rail by a lever, by the regulation of which any amount of adhesion may be obtained. This mechanical adhesion has the advantage of being graduated to circumstances, for on running on a level but little adhesion is required, and on reaching any inclined surface it is put on in a quantity requisite for ascending, and no more.—Thus are avoided the effects of weight in a great measure; whereas, on the ordinary principle, much dead weight is put on, only to be made use of at certain points, and destroying the road on every passage

over it. The engine used for the experiment is only 3½ tons, and was built by Messrs. Hogg & Delamater of New York, under the superintendence of Capt. John Erickson, a gentleman well known for his great mechanical talents. Up this grade of 200 feet, this little engine drew a passenger car filled with about 100 passengers, at a velocity of perhaps ten miles an hour. On descending, both engine and car were perfectly under control, capable of being stopped at any moment in a space of ten feet, and this while descending by steam power and the force of gravity combined.—The experiments have clearly indicated the practical use to which this invention can be applied.

Among the two hundred persons present on Saturday, there seemed to be a general gratification with the experiment. One of the great objects to be gained by this invention is that the same power may be obtained by a lighter engine and cars, and consequently less wearing out and injury to the rails. We hear that the highest grade ever surmounted by locomotives is one hundred and eighty feet in a mile, in Pennsylvania. But there, it required a locomotive of 20 tons—while, with Mr. French's invention, a locomotive of only 3½ tons [the "Climber"] overcame a grade of two hundred feet in a mile. When the experiment shall have been fully tested, and a heavy weight shall have been drawn up and down, and great power shall have been obtained by lighter engines, it will be for the State to order the adaptation of the invention to some portions of the various roads now being built, to which it is applicable. We know not what may be the effect, in time, of the heavy friction of the two small rollers, revolving 1700 times, while the driving wheels revolve only 32 times.

We are not engineers enough to venture a prediction as to the permanent usefulness of the invention. As far as it went, it succeeded perfectly on Saturday, and we heard several mountaineers declare that if the invention could succeed in overcoming the grade of the present experiment, it would be sufficient for railroads through their mountain passes. In this age of invention, we would not be surprised to see this application so improved, that, in less than a year, it will be made use of in surmounting the Blue Ridge, superceding the very expensive and snail-like tunnels through the mountains.—*Richmond Inquirer.*

A NEW PILE DRIVER.

A very ingenious machine for driving piles has been exhibited to us within the last few days by Mr. Frederick Lear of this City, the inventor. The construction is simple and well adapted for making railroads, dikes, causeways, levees, wharfs, &c. It is not

attached to a boat or skow, as such machines usually are, requiring a certain depth of water for them to act in. Mr. Lear's machine moves upon a temporary railroad, which it constructs upon the piles as they are driven; the machine driving alternately on each side of the track, whilst a circular saw is made to act upon and cut off the tops of the piles at the proper level. Upon these piles are placed the ties or cross pieces and on them the temporary rails upon which the whole apparatus moves. These ties and rails are movable, so that as the machine advances, what has been passed over is taken up to be used again in front.

From this description it will be seen that the machine must be well adapted to making roads, levees &c., in those swampy, wet places, where the ordinary pile driver cannot work. We should presume therefore it will be very valuable in the improvement of swamp lands of this and other States, and not less useful in the coustruction of the railroads, that may have to pass through them. We recommend it to the attention of Engineers and Contractors.

OUR REPUBLIC.

BY MRS. MARY R. HALL.

Much less than a century ago, a band of wornout soldiers from the battle-field, laid down their weapons of warfare and divested themselves of the soiled and tattered garments of the camp. Theirs had been a fearful contest; a struggle for life; yea *more* than life,—for LIBERTY!

We need not here recount their sufferings,—we need not describe the scenes of blood and carnage through which they had passed, nor dwell upon the agonies they had endured, suffice it to say, that the battle had been fought, the victory won, while the oppressors fled, yielding up to their conquerors the liberty for which they had so gloriously struggled. The news spread like lightning speed from place to place; and then many a fond mother watched with anxious eye each form that appeared in the dim distance, that she might, perchance, catch the first glimpse of a returning son; but as days sped on, and yet he came not, hope beamed with a faint and still fainter light, till the heavenly visitant came no more to cheer her desolate heart: for the bones of her first-born lay bleaching upon the battle-field.

Then, too, might be seen the almost phrenzied wife, counting with nervous anxiety the passing days; hoping as each returned, that the setting sun would restore her best beloved to still the wild throbbings of her heart. Her little ones vainly lisped the oft re-

peated name; for the dear one came not: on yonder plain his blood has been spilt,—he had fought and died in his country's cause!

Maidens, too, wept in secret, for well they knew, hearts that once had beat responsive to their own, were now pulseless and cold; while sisters indulged in clamerous grief for the beloved ones who had left them, no more to return!

Then came the wild shout of LIBERTY, reverberating through hill and vale: and the mourners hearts were comforted. The stars and stripes waved in triumph, as Freedom boldly planted her standard upon American soil!

Nations looked on, astonished, and in their hearts prophesied the downfall of the grand structure of Republicanism. How a People could choose its own Rulers, enact its own laws and defend them—at the same time maintain its independence and preserve harmony throughout the nation, rising high and still higher in wealth and power; was an enigma, which crowned heads had not the power to solve!

But with a Washington at our head, laws were enacted, which served to bind together the hearts of the American people;—to defend their rights as a nation, and as individuals. When dissensions have arisen in our political world, monarchs have looked to see the noble structure totter and fall, while nought remained to tell of its former greatness, save a mass of glittering ruins. But years have passed away and yet our Union remains, the glory of the whole earth. The waters of the proud Atlantic kiss her eastern borders; while far away toward the setting sun, the great Pacific lashes its waves upon our golden coast! All nations have contributed to our wealth and population,—the poor have sought here a home—the distressed have found relief and comfort, while many oppressed ones have fled hither for protection—broken off their yokes of bondage, and are now rejoicing in their liberty. America now stretches forth her hand to the ends of the earth, and welcomes with enthusiasm, the sons and daughters of other climes, who seek to share the rich blessings she bestows!

In the eastern hemisphere, political commotions and revolutions have constantly been taking place—Monarchs have been dethroned and disrobed of royalty,—Kingdoms and Empires have been shaken and crushed by the deadly stroke of oppression—the shrill notes of the clarion have sounded their death-peals as countless hosts were marshalled upon the battle field, where sped the sure arrow of destruction, hurling thousands, unprepared, into the eternal world!

And yet our Republic has not been shaken! During all the convulsions of other nations, she has remained firm—new stars have been added to the glorious constellation and her light may be seen to the uttermost parts of the earth. The Islands of the sea she hath made to rejoice, for there hath she planted the standard of the cross! Pagan nations, groping in their midnight darkness;

a faint glimmering of her glory, and already hath her light broken in upon the gloom which envelopes their benighted land. Monarchs acknowledge her power and admire the strength and beauty of her structure.

In consideration of all this, it becomes us to inquire, to what can our present prosperity be attributed? Is it because our numbers exceed those of other nations—can we boast more wealth than they? Is our climate more favorable—our soil more productive than that of many other portions of our globe? Does Pestilence never scourge, nor the dark-robed angel scatter broadcast the arrows of death in our midst? Has the great Being endowed us with greater physical powers or superior intellects, compared with the rest of mankind, or caused the lamp of reason in our souls to burn with a brighter glow? Most assuredly there is a broader, a *deeper* foundation than all this, upon which the glorious superstructure of our Republic rests!

I know that skeptics will scoff at the idea; but take from us divine Revelation—blot out forever the commandments of Jehovah, as thundered forth from Sinai's rugged mount—erase from the memory of man the thrilling scenes that transpired upon the brow of Calvary—thrust aside and trample under foot the teachings of holy men of old, ay, of the Saviour himself—let laws be framed without any reference to those emblazoned on tables of stone—close the mouths of those who go forth as Heralds of the Cross, and let the glorious news of salvation cease to be proclaimed to fallen man,—close up all avenues for religious instruction, and how long, I ask, before our Nation would be hurled from the pinnacle of its glory? Surely, before the close of the present year the sword of Jehovah would be unsheathed—divine indignation would be aroused—the fiat would go forth and judgments spread desolation throughout our goodly land! Like Nations of old, who set at naught and trampled under foot the laws of the Most High, we should be left to suffer the awful penalties, inflicted for the like transgressions. Internal commotions would soon rend assunder that bond of Union, of which we now delight to boast—political dissension would invariably lead to war and bloodshed—jealousies would be enkindled in the heart of man and burn with intensity, until the demoniac passion maddened his brain—laws, if made, would be disregarded,—our vast, our mighty Republic would be shaken from its foundation, and as its agonizing death-throes were borne upon the dark wings of the tempest; Peace, would gaze with tearful eye upon the gilded wreck, and heaving one solitary sigh, which earth, itself, would re-echo, would haste to plume her trembling wings for an eternal flight!

If, then, it be true, that our Republican Government is based upon the principles of Religion, it becomes us to feel that a holy bond exists which should serve to bind together all parts of our

Union; the dissevering of which would be followed by most disastrous results.

Our forefathers fought and sealed the liberty we enjoy with their heart's blood. It has been handed down to posterity as a sacred relic; still stained with the life-drops, with which it was so dearly purchased! And shall we regard it as a light thing, a mere toy, to be dandled in our pleasant mood, but thrust aside and trampled into the dust at any moment when the dark scowls of passion stamp their fearful impress upon our brow? Shall differences of opinions or political dogmas serve to sever, or even *weaken* the tie, that binds us together as different members of the same great family, over which floats the glorious "star spangled banner," with its ample folds? May God forbid!

We rejoice that the great Heart of America still proudly beats for perpetual Union; although some connecting arteries would fain be severed from the rich fountain of life from which they draw their nourishment, thus bringing destruction upon themselves, and paralysing the source from whence they spring.

That there are many mars and blots upon the fair face of our country's fame, no one will attempt to deny. But in their removal it were well to do it in such a manner, that no scars remain, more fatal than the malady; or that a more blighting or deadly curse may not spread itself over our already defaced parts.

But it is hoped, yea, *believed*, that the unerring hand of Providence will overrule all things for our good, so long as we, as a Nation, observe His holy laws—walk in His precepts and look constantly to Him for guidance and protection. A praying Nation will not be overthrown; the arms af the Almighty are a sure defence, and form a barrier, which no conqueror shall be able to demolish.

Ever trusting in the Lord of Hosts; we may with perfect security march boldly on, while *onward* and *upward* shall ever be the watchwords of Columbia's sons and daughters.

Harrisburg, V. B. Co., Iowa.

READING AND STUDY.

BY EDWARD STAGG.

Between Reading and Study there is a wide difference. The former may be compared to the travelling in a railway car, propelled at the rate of forty miles per hour; the latter, to the travelling on foot, and walking. In the former case, the eye, though it sees everything which comes within the range of its vision, does not *take notice*. In the latter case, the eye not only takes particular notice, but charges the memory with its faculty of retention.

And, to enable the memory the more certainly to retain, the eye often lingers, while the mind reflects, on such objects as, by their more importance, or beauty, invite its detention.

In Reading, then, the printed page is the territory over which we pass; the eye is the railway car, and the mind is the passenger. Would we could say, with truth, that but little, save mere entertainment, can be expected from such a mode of mental travel.

As mere change of scene and of air frequently produce good to our material part; so, that skimming over the page of what, in popular phrase, is denominated "light reading," may benefit, by recreating, our immaterial part. But—be it remembered—as to derive benefit from change of scene and of air, the individual must go to where the former is pleasing, and the latter is impregnated with no noxious substance; so, to benefit the mind and the heart, the printed page must present no harrowing spectacle, nor have any taint of impure sentiment, or debasing exhibition.

That printed matter to which the term Reading is more commonly applied, consists, in part, of: Newspapers, Literary Weeklies, Monthly Magazines, and Novels.

It is usual to say, when referring to his preparatory course of study for the legal profession, that such an individual "read Law with"—so and so. This expression is not strictly correct. While preparing for the Ministry, or for the practice of Medicine, the person *studies*. This he *should* do, at least, if intending to practice Law. We would not be invidious here, and hint of there being many in the legal profession who have evidently only *read* Law; for we might, with equal justice, as broadly hint that the two other professions we have named, include within their numbers those who, if they have *studied*, have done so to but little purpose.

It is common to speak of "reading the Bible." And this duty is enjoined by all truly evangelical clergymen. The Author of the Bible, however, has commanded that the Scriptures be "searched," —and this occupation involves diligent study.

Newspapers are that species of printing which has the largest number of readers. This is because they are so many, and because so valuable in conveying intelligence from one part of a country to another, and from one country to other distant, as well as adjacent, countries. We might here write a large 8vo. on the great benefit of the newspaper Press—a Press, we mean—like that of our own Country—free of Government restrictions. A people without a free Press cannot be a free people; nor can they be an intelligent people. But, while newspapers do a vast deal of good, and are mighty instruments in making, and in keeping, a people free and independent; it cannot be denied that they sometimes do evil, and are powerful instruments in corrupting minds, and inveigling many into the ways of error, and the paths of vice. It is a gratifying fact, however, that the good they do is vastly paramount to the evil which they incite.

Most all Newspapers present their readers with excerpts of a literary, or a scientific, character; and some offer tales of fiction. But, the chief design and intent of such is to give news. Of the Literary Weekly it is more particularly the province to furnish tales, poetry, and articles on the arts and sciences. These papers aim at giving as much *original* matter as practicable. And in this are the better catering to the public taste.

It were remarkable—could we not divine the cause—what superior attraction is possessed by any article—especially a tale—which has prefixed to its title, in large capitals, the word ORIGINAL. There are those who will not read a *selected* article, or an excerpt, though bearing the name of some popular author, when they are presented with an original production. The solution of this preference must be referred to that insatiate desire for "something new," which mankind manifest in almost everything.

The weeklies in question contain a summary of the news, both foreign and domestic, of every sort, which was furnished by the dailies during the week intervening the days of their publication. The low rate at which they are afforded, and their being a sort of *multum in parvo*, render them popular; and, hence, their circulation is widely extended. They go more completely into the hands of every member of the domestic circle, than does any other form of printed matter. It must be obvious, therefore, that they exert an influence—more or less powerful—for good or for evil. The evil which some of them do, is communicated in the subtle description, or the impure sentiment, of the writer of fiction; and in the celestial drapery with which he is wont to clothe moral deformity, and otherwise revolting vice. But, as we shall refer more at large to this melancholy tendency, when we speak of Novels, we will defer the subject.

The monthly Magazines—such as Godey's Lady's Book, and Sartain's and Graham's Magazines—are well patronized. The most of them being conducted with good judgment, and more with an eye to purity in contents, than the weeklies seem to be, are very welcome visitors to the family circle. They are designed, more particularly, for the female portion of creation; and their contributors are, for a great part, of that sex. The literature which they contain is, generally, of a light order; but many of their articles are exceedingly well-written, and convey a good moral.

There is another class of Magazines, published monthly, more commonly called by the general name of Periodical. Their contents are of a more standard order, and they are designed for the more thoughtful reader. They are devoted, chiefly, to the Arts and Sciences, Agriculture, Internal Improvements, and Reviews. Prominent among these publications are, *The Western Journal*, published in this City, by Tarver & Risk; and *Hunt's Magazine*, published in New York.

To those works of fiction, designated by the name of Novel, if

we wish to speak of their numbers, we may, with strict propriety, apply the appellation Legion. They may be divided into two general classes: that of those entirely fictitious; and that of those denominated Historical Romance. In these classes we have those Novels designed to exhibit the affections and passions of the human heart, as discoverable in domestic life; and those designed to show man on his more extended stage of action.

All Novels, which deserve the name, have some design, and are intended to convey some *moral*, as it is termed—though their tendency is too frequently to immorality. But, it must be admitted, that there are many works of fiction, in which it is hard to discover any aim, or design, whatever. When Solomon said, "Of making books there is no end," his prophetic vision must have penetrated into this the middle of the nineteenth century. For, it is a fact, not at all suggestive of gratifying reflections, that the Press now *teems* with certain books of fiction, whose only recommendation is that they are cheap, and whose entire beauty consists in their yellow covers. They are alike destitute of plot, of good grammar, and of style. Yet, they are eagerly sought, and greedily read. We do not believe, however, that *such* do *much* harm.

He is narrow-minded, and short-sighted, indeed, who condemns *all* works of fiction. Among those entitled to the name of Novel, there are many which do good, by the good moral they convey; by the agreeable diversion they afford to minds which are daily pressed by the cares, or the sorrows of life, and by the desirable relaxation they yield to those minds otherwise constantly exercised on professional study. The Novels of Sir Walter Scott will serve as a fair example. On the shelf of many a well-selected Library you may find these works, strongly bound and bearing the lineaments of standard literature.

To refer to a living female writer, whose works of fiction are doing much good, we will mention the name of FREDERIKA BREMER. Whenever, as with her, the book of fiction, while it affords rational entertainment, is made to subserve the purpose of a pleasant moral teacher, then such creation of the imagination may not be proscribed without our relinquishing all claim to fairness and discrimination.

But, there are writers of fiction, not a few—celebrated artists in painting scenes of fancy—whose productions must receive the unqualified condemnation of every well-balanced intellect. Wherein lies the sin of these writers? do you ask? Not so much, possibly, in their exhibition of the darker passions, and of the vices of humanity, as in the *apology* which they offer for the vices and the debasement they depict. This apology does not *discover* itself, but is conveyed within the specious excuse, and under the attractive drapery. These ingenious writers know that,

> "Vice is a monster of so frightful mien,
> That, to be hated, needs but to be seen.—"

And, hence, like their great Spiritual Adviser, who ofttimes transforms himself into an angel of light, they too frequently "put light for darkness." They seem to delight in taking their reader to the top of some mountain of their fertile fancy, and there, for his amusement, (would it were his amusement only!) and their own glorification, transfigure the incarnation of moral blackness. Great artists are they, surely! With consummate skill, they mix the various pigments and the compound colors lie well arranged upon their mental palette. At the touch of their magic pencil, these colors flow, and do their office; and in a very little while, a gorgeous picture is made.

As we have mentioned a female Novelist of great popularity, whose productions are doing much good, we will name, in strong contrast, another female writer of fiction, whose works are doing incalculable evil. We allude to the *woman* "GEORGES SAND." To borrow an idea from a female writer in a late number of one of our Lady's Magazines, it would seem that Providence has raised up FREDRIKA BREMER for the very purpose of antidoting the evil of "GEORGES SAND."

But, has a BULWER nothing to regret, in some of *his* works of fiction? If he has, may we not, with more pertinency, ask the question of DEKOCK, of DUMAS, and of SUE? These last, with less of genius than the first, have more basely prostituted their faculties of intellect. They have scattered more noxious matter upon the literary atmosphere; and, with the large majority of mental constitutions, there is poison taken in with every inspiration.

We are persuaded that there is more evil communicated to the young heart by such works of fiction, than through any other influence by which that heart is surrounded, or with which it may come into contact. Female purity of heart is in imminent hazard of violation, whenever the works of a "GEORGES SAND," of a DEKOCK, of a DUMAS, or of a SUE, become the female's constant, or too frequent, companions. And we wonder not at the frequent defections, and the infelicity, in wedded life, when we learn that such works as we have named, have been the society of the apostate, or the unfaithful, wife's more retired hours.

We have said, that, between Reading and Study there is a wide difference; and we have compared the former to travelling in a railway car, going at a rapid rate; the latter, to travelling on foot. We have meant, by the comparison, to show, that, in Reading—as that word is generally applied and understood—the memory does not, except, perhaps, at distant intervals, perform the duties of its valuable office. Names, localities, dates, &c., are scarcely communicated to mind at all; while that which appeals to passion, permeates the mind, and makes its impress upon the heart. So that, by Reading, the *heart* may become affected—so as to run out in the conduct and the life—while the understanding remain

unenlarged, and the storehouse of memory continues unpeopled by new ideas.

Thus much for Reading.

Study may be defined as that application of the mental faculties to the subject presented, which insures that subject's retention in the memory; where, as a bought possession, it remains for use. There *is* a study which is not of books, and from it we derive a vast amount of valuable knowledge. We allude to that afforded by observation. But it is not our present purpose to enlarge on this sort.

The number of those who find delight in Study is very small, compared with that of general readers. Study is looked upon, by the large majority, as a task; and a task is seldom pleasurable.

It is needless to go over the long catalogue of books, on the many various subjects, which are more particularly used for Study. We may remark, however, that, in that catalogue, History holds a prominent place. We know that History is generally considered "dry." But, it has a powerful influence upon a reflective mind in leading it to perceive the mutability and uncertainty of all mundane things, and in showing us, by comparison with the ages that are past, what a brief space is the term of human life. It exhibits to us, moreover, the different characters of individuals, and portrays for us the hopes which animated, and the fears that depressed, in every age, those of like passions with ourselves. And History illustrates the fact that human nature has been the same in all ages of the world; while it gives us abundant evidence that man is a depraved being.

To right and profitable Study, three operations of the mind are, generally, necessary: attention, reflection, and repetition. It is to the weakness of the first of these faculties that may be traced the inability of the old to recollect distinctly. That faculty is indispensably necessary to memory; and, chiefly in proportion as attention is stronger, or weaker, will recollection be more or less vivid.

Reflection, also, is not only necessary to the bare recollection of fact, or circumstance, but it is the *suggestive* faculty, which enables us to use our acquisition to the best advantage.

Reflection, or the bringing, frequently, before the mind, objects which have been presented to it, is necessary to recollection, with almost every one, we believe; and the process is indispensable, we may affirm, whenever dates, or names, are to be recollected.

We are aware of the difference subsisting between minds, as respects their faculty of memory. Some persons there are, who, on reading a sentence once, can recollect the statement, or argument, contained therein. While, there are others who, to recollect the same passage, are obliged to re-peruse it several times. It is frequently the case, however, that those who recollect with so little effort, at the time, and who do not bring the subject more or less frequently before their minds, soon cease to recollect distinctly;

While, again, those who can memorize, or more properly speaking, recollect, only by frequent repetition, at the time, retain their information for a much longer period.

To bring forward our figure. Study is the passing over the territory, on foot. To be benefitted, by recollection of the scenes presented, we must pause, while we gaze at such as may serve to delight, or to instruct, and look attentively upon them.

We once heard the metaphorical expression that, Mr. A., who not long since had made the "grand tour" of Europe, "travelled in a balloon." To drop the metaphor, he *saw* a great deal, but *noticed* nothing; and he returned as well informed about matters and things abroad, as he would have been had he remained at home.

Of course, stopping frequently on the way renders travel slow; and, by such intermittents, so large a space cannot be gone over, in a given period, as there could be by going at a regular and more rapid pace. The desire and the aim to accomplish much, in a little time is the spirit of the present age. It will not do, however, in the matter of Study. Infinitely more can be learnt by the careful study of a few judiciously selected books, than by simply Reading hundreds of volumes. For the purpose of Study, let books be few and well selected.

That continual hunger and thirst for knowledge, which some persons experience, and which gives such zest to the pleasures of the understanding, we should not seek to remedy, by withholding intellectual meat and drink. Let the longings be gratified. He may be accounted happy, who, at the close of every day in which he has gained no more knowledge, nor conferred any benefit, can exclaim with TITUS, in regretful tone, "*Perdidi diem!*"—I have lost a day.

But, we drop the interesting subject of Reading and Study, which is worthy of a volume. We simply add, that, what has made civilized man differ from savage man, is Study.

We stop not yet. We hear a "still small voice" whispering us to pay our tribute of Study to the biography and the precepts of HIM, who lived, and spake, as no man ever did. Can one be more profitably engaged than in going over the land of Palestine by HIS side, and listening to the tones of His melodious voice! And then, having bade HIM farewell on Calvary's Summit, and taken a "last fond look," as HE ascended to glory from the top of Olivet, may we not find the sweetest pleasure in dwelling on the things the FATHER hath prepared for them that love HIM! "Eye hath not seen" them; "neither have they entered into the heart of man" that he may know what those glories are. But, through the translucent veil of the Apocalypse, we may perceive enough to delight us, while we wonder and adore.

How valuable, then, the Study which gives us the initiatory of that science—the "Science of Eternity"—which, when we shall

have "shuffled off this mortal coil," we shall, by progressive steps, be permitted to comprehend!

LOVE.

FROM THE MSS. OF THE SENIOR EDITOR.

The writings of poets, philosophers and divines abound in definitions of love; but none, we believe, have attempted to define the peculiar office which this mysterious property was designed to perform in the moral and social economy of man.

Those who profess to instruct mankind deal, chiefly, in description, comparison and precept: they furnish charts for the ocean, describe the currents, the shoals and the winds; compare the dangers of different routes, and, like true philanthropists point out the way of safety; but all this is not sufficient to ensure a prosperous voyage; the mariner must comprehend the science of navigation, the structure of his vessel and, also, the machinery and nature of the motive power by which it is propelled. Or, in other words, man should study the principles or properties which constitute his own nature that he may comprehend their propelling forces, and, the uses for which they were designed by the Author of his being.

Then, what is love, and what office does it perform in the individual, social and moral economy of man? "God is love; and he that dwelleth in love, dwelleth in God, and God in him." It is an inherent property of man's nature, emanating from Deity and not less essential to his existence than to his happiness. Were it withdrawn from man his race would perish from the earth; for he would cease to associate with his species except for the perpetration of deeds of mischief—he would realize the condition of the fallen angels.

Love is an active principle, susceptable of being excited by whatsoever is beautiful or useful in the physical, or excellent in the moral world. The emotions thus excited are involuntary; but the desires to which they give rise are subject to the control of reason. The emotions of love are more or less vivid according to the quality of the exciting object, as perceived by the mind, and the wants and tastes of the individual. If excited by phisical objects, they are usually succeeded by a desire of possession; or, if the object be such as cannot be appropriated—a sunsetting scene, a rain bow, or, the sublimely beautiful vault of heaven, bespangled with stars innumerable—the emotion is succeeded by a sense of reverence and love for Him who endowed us with faculties capable of appreciating the beauty and grandeur of his works. When excited by moral qualities, the emotions of love are succeeded by a desire that the possessor of those qualities should reciprocate the sentiment experienced by ourselves; and this desire prompts us to imi-

tate those actions and virtues which excite our admiration. Hence we perceive the use and operation of love, as a great moral agent. Ever responsive to impressions of beauty, truth and purity, it inclines the heart to harmonize with those principles; and, were it not that man's reason has been stultified by ignorance he would, ere now, have been elevated from his fallen condition to a state of inconceivable excellence and felicity.

But, it has been said that, love is blind: that man loves unworthy objects, and, that, he even delights in the indulgence of passions which are at war with his moral nature. Love does not perceive the modifications and restraints which the condition of the individual and of society impose upon its desires: this is the office of reason; but its emotions are never excited by deformity; nor by obvious and undisguised vice.

Objects of love are not less necessary to our happiness than is food to the support of our physical existence; and, consequently, although it is the nature of man to love the highest degree of excellence which his mind is capable of conceiving; yet, "the strong necessity of loving" combined with the accidents and circumstances which control his actions compel him to love objects which he would have turned from with loathing and disgust had his mind been enlightened and his condition free to follow the true instincts of his nature.

The desire for food must be gratified: and if the best and most palatable viands cannot be obtained we accept that which is less desirable; until, reduced by necessity, like the root diggers of the desert, we feed upon reptiles and insects. So, if from ignorance, or other cause, we should be rendered incapable of loving objects and qualities calculated to afford the highest state of enjoyment we select a lower degree of excellence; and may be compelled to love any object which possesses the smallest degree of virtue. In such cases we do not love that which is vicious; but the small proportion of virtue mingled with the compound. It is obvious, however, that affection for unworthy objects cannot afford that high sense of enjoyment which love was designed to impart; yet, are we doomed to drink of the cup, and drain it to the dreggs, although it may contain poison.

Love cannot exceed the mind's conceptions of the beautiful, and the excellent; and hence the ignorant and the vicious perceive but little to love in the physical or moral world. They look out upon the ever varying aspect of nature "with brute unconscious gaze" and discover nothing beyond the surface to excite emotions of love and reverence for the Author of the Universe.

To them, the social or moral world presents still less to excite their affections; for regarding their own condition as one of privation and suffering they look upon mankind as an adversary against whom they are doomed to wage a perpetual warfare. In their estimation, justice is oppression; mercy, a weakness; chari-

ty, a knavish policy; and religion, hypocracy. But even in his lowest estate man is not wholly destitute of the principle of love; for when all other objects fail to excite its emotions, self-love still survives and urges him onward to sustain his own existence though cut off from the sympathies of his race.

Thus, we perceive that this illimitable source of happiness is shut out from the human heart by ignorance. Learning and religion have done much to ameliorate the social condition; but, we are persuaded that one very important department of philosophy has been too much neglected. The benevolent designs of the Creator, as evinced in all his works, are not sufficiently studied and appreciated. One who has not cultivated a taste for the beauties of nature; who does not perceive the harmonious relations existing between the moral and physical world, is deprived of one of the principal sources of love and reverence for the Author of his being. By such an individual, every physical obstacle that lies in his way, and every change in the seasons, not agreeable to his senses, are regarded as positive evils: and, so frequently do these causes of annoyance occur that it is but natural he should call in question the benevolence of the Creator and contemn his works.

Neither have the elements of social philosophy received that consideration which they deserve.

To comprehend this science man must study the principles of his individual nature; note the emotions which arise in his own mind, and the desires which flow from them; and, observe the influences which give direction to his actions. From these mental observations he will discover that the primary emotions are always consistent with the most perfect development of his physical and moral natures: but his desires and actions being modified by external causes may be virtuous or vicious according to the accidents and circumstances, whether physical or moral, which govern his condition. The emotions of social love, the great moral element of man's nature, are often, if not continually suppressed in the minds of many by the belief that human nature is profoundly depraved; for none can love depravity. Entertaining this opinion man dares not, even were it in his power, to love his species in the spirit of the christian precept. Were the mind impressed with the truth that, although man is subject to many vices, yet, the principles which constitute his being flow immediately from the infinite fountain of wisdom and benevolence, this obstacle to social love would be removed; brighter and more consistent views of the benevolence of the Creator would be opened to his mind, and inspire his heart with Divine adoration.

Love is a living fountain springing up continually in the heart; but ignorance and distrust close the portals of its egress: remove these obstacles, and like the sealed fountain in the rock in Horeb, opened by the prophets rod, it flows in copious streams to refresh and make glad the hearts of others.

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MATHEMATICAL and Surgical Instrument maker, Dealer in Guns, Pistols and Sporting Materials, No. 58 North Second Street, between Pine and Olive, S. Louis, Mo., Manufactures and has always on hand: Surveyors' Compasses, Levelling Instruments, Theodolite Pocket Compasses, Spy-glasses, Barometers, Thermometers, Drawing Instruments, Spectacles, Ivory and Gunter's Scales and Protractors, Hour and Half Hour Glasses, Microscopes and Magnifying Glasses, Hydrometers of silver and glass, Hydrometers for acids and salts, Magic Lanthorns, Electrical Machines, &c., also—Surgical and Dental Instruments; Pocket, Dissecting, Cupping and Self-injecting cases; Taylor's Shears, all sizes; Syringes, large and small, Scarificators, Lancets; Forceps; Turnkeys; large Scales and Weights, for Druggists; Prescription Scales on Stands; Revolvers, Guns, Pistols, Powder Flaks, Game Bags, &c., ☞All the above Instruments repaired at short notice in the best manner.

Wilson & Brothers,

WHOLESALE DEALERS IN HARDWARE, corner of Main and Olive streets, St. Louis, Mo.

C. BENEDICT, Danbury, Conn. D. PEARCE, St. Louis, Mo.

David Pearce & Co.,

MANUFACTURERS and wholesale dealers in Hats, Caps and Straw Goods, No. 120 Main street, St. Louis, Mo.

Hewitt & Steinacker,

SADDLE, Harness and Trunk Manufacturers, wholesale and retail, No. 67 Fourth street, corner of Pine, opposite the Planters House, St. Louis, Mo.

M. B. COX. WM. SIMPSON. GEO. BURNET, JR.

M. B. Cox & Co.,

WHOLESALE dealers in Boots and Shoes, Shoe Findings, Hats, Caps and Bonnets, Artificial Flowers, Umbrellas and Parasols, Pongee and other Silk Handkerchiefs, Hosiery and Gloves, Trimmings, Small Wares, and Variety Goods, No. 91 Main street, east side, between Locust and Olive, St. Louis, Mo.

J. A. Ross,

SCALE and Spur Factory, Brass Foundry and Machine Shop, 202 north Second street, between Morgan and Cherry streets, St. Louis, Mo. Constantly on hand and manufactured to order, Platform Scales of all sizes, Counter and Druggist Scales, Flour, Floor, Hay and Car Scales. Also, Beam Scales of Iron or Brass. Scales repaired with neatness and despatch. Spurs, for Dragoons and others, and Brass Castings furnished on short notice.

P. Wonderly,

MANUFACTURER of Copper, Tin and Sheet Iron Work—such as Copper Pipes for Steamboats and Distilleries, Soda Fountains, Copper Kettles, Well Cistern Pumps, and every other article in his line of business; No. 233 Main street, south east corner of Cherry, St. Louis, Mo. He also manufactures and keeps constantly on hand, Premium Steamboat Cooking Stoves. Tinware always on hand, wholesale and retail.

Glover & Campbell,

Late of Palmyra, Mo., Attorneys at Law,

SAINT LOUIS.

John C. Meyer,

Dealer in Hides, Leather, Oil, and Findings,

No. 88 North Main Street, St. Louis.

H. W. LEFFINGWELL, Notary Public. R. S. ELLIOTT, Com'r of Deeds.

Leffingwell & Elliott,

REAL ESTATE Dealers, Auctioneers and Conveyancers, No. 123 Chesnut street, St. Louis, Mo. Real Estate sold on commission, at private sale, or auction. Also, Deeds of all kinds written, and acknowledgments taken. Maps of the city and additions, to be seen at the office, and information given free of charge. Surveying done promptly and correctly.

Charless & Blow,

NO. 70 and 72, Exchange Building, St. Louis, Mo., Importers and dealers in drugs, medicines, oils, paints, dye stuffs, perfumeries, window glass, glassware, &c.

O. W. Jerome,

WHOLESALE and retail dealer and manufacturer of Cabinet Furniture, chairs, bedsteads, &c., Nos. 44, 46 and 48, Olive street, opposite the Monroe House, Saint Louis, Mo.

Sligo Book Store and Paper Warehouse.

AMOS H. SCHULTZ, No. 136, north Main street, St. Louis, opposite the Bank. Wholesale dealer in books, paper and stationery.

THE undersigned takes the liberty of informing you that he has removed his place of business to Olive street, a few doors above Main, south side, in the Exchange Building, and three doors above Messrs. E. W. Clarke & Co's. Banking House, where he is now opening, and will continue to receive during the Spring months, a large and full assortment of the most

Fashionable Styles of Goods,

In his line, for gentlemen's wear; and where he will be pleased to see his old friends and customers, and their friends with them; and assures those who may favor him with their patronage, that they shall receive his personal attention, and his best efforts to please. Very respectfully, your ob't servant,

J. G. SHELTON.

Giles F. Filley,

MANUFACTURER of the celebrated prize premium cooking stoves; also, Irving's air tight cooking stoves, fancy parlor stoves, fancy box and coal stoves; dealer in tin plate, copper, sheet iron, block tin, rivets, tinner's tools, machines, &c. Warehouse No. 163 north Main street, St. Louis, Mo. Foundry on Lewis street, near the water works.

Clothing at Wholesale.

ARCHIBALD YOUNG & CO., 99 Main street, St. Louis, Mo., Wanzer Minor & Co., 126 Pearl street. Yew York, Moses Wanzen and Henry J. Minor, New York, Archibald Young, St. Louis.

N. B.—We manufacture all of our own goods, and sell at the lowest possible prices.

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CORNER of Second and Morgan streets, St. Louis, Mo. We are prepared to fill with dispatch, and to fit up in superior style, all orders in the Foundry and Machine business, such as steam engines, mill work, mill castings, railroad cars, wheels for coal trucks, lard and soap kettles of all sizes, press screws, &c., made to order at short notice. Wool carding machines, shearing machines, and a large and superior stock of machine cards, we will warrant equal to any in the Union. All orders from the country will meet with prompt attention.

J. T. TOWDALL & CO.

Doan, King & Co.,

WHOLESALE Dry Goods dealers, 131 and 133 Main street, St. Louis. Job P. Doan, St. Louis, Wylley King, do., Richard Bigelow, New York.

Edward Mead

IMPORTER and wholesale and retail dealer in watches, jewelry, cutlery, guns, pistols and fancy goods, No. 83, north Fourth street, first block north of the Planters' House, east side, St. Louis Mo.

Crow, McCreery & Co.,

WHOLESALE dealers in Dry Goods, No. 71 Main street, St. Louis Mo. Wayman Crow, Phoceon R. McCreery, Wm. H. Barksdale, Wm. A. Hargudine, Charles D. Appleton.

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T. MULLEN, Tobacco Commission Merchant, 21 Washington Avenue, St. Louis, Mo., for the sale of Cuba and Havana Tobacco; also, for Virginia manufactured tobacco, for which he has the agency.

J. BUNDING. B. VOIGT.

Bunding & Voigt.

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Great Western Clothing Emporium!

WHOLESALE AND RETAIL,

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BAKER, NELSON & Co., 51 Cedar street, New York.

Fallon & Wright,

CARRIAGE mamufacturers and dealers, No. 90, Fifth street, between St. Charles and Locust, are constantly manufacturing, and have on hand, all styles of carriages, which they will sell on the most reasonable terms. They flatter themselves from the experience they have had in the business, to be able to furnish as good an article as can be bought in any market. Citizens and strangers are requested to call and examine for themselves. All carriages made by us are warranted to be as represented, or the money refunded. WESLEY FALLON,

JAS. A. WRIGHT.

P. Hayden,

(SUCCESSOR TO P. WILSON & CO.)

IMPORTER and manufacturer of saddlery, hardware, carriage trimmings, saddle trees, hog skins, skirting, harness and bridle leather, wood and iron hames, &c. 47 Second street, (east side, between Pine and Olive streets,) St. Louis, Mo. Manufacturing the greater portion of the articles in my line and importing the remainder, my advantages are superior to *any house in the trade.*

Woods, Christy & Co.,

WHOLESALE dealers in Dry Goods, No. 75 Main street, St. Louis, Mo.
James Woods, William T. Christy, James C. Christy, Robert K. Woods.

Fruit Trees and Shrubbery,

FOR sale by JOHN SIGERSON & BROTHERS, at their fruit farm and nursery. This establishment is located seven miles South of St. Louis, Mo. There are Omnibus Coaches running daily from the City within one half mile of the establishment. The Nursery and Gardens are open at all times (Sundays excepted) for the reception of visitors. Horticulturists and Amateurs are respectfully invited to visit the establishment and examine for themselves. In directing the attention of the public to their nursery, they would remark that one of the firm, (Mr. James Sigerson,) has been engaged in the above business for the last twenty-five years; during that time he has tested many of the varieties now growing. This, with the assurance on their part of an intention to increase the number of their trees, as well as to add to their assortment from year to year, furnishes a strong guarantee to persons wishing to make choice selections of fruit, that they can always be supplied. Their prices for trees will be as reasonable as at any similar establishment East or West, and when desired, trees will be delivered free of charge in the city or on steamboats; packed in good order for their destination.

☞ All letters addresed to John Sigerson, St. Louis, or to James Sigerson, Carondelet, will meet with prompt attention.

JOHN SIGERSON & BROTHERS.

M. PAWLEY. H. B. HAWKINS.

Pawley & Hawkins,

MANUFACTURERS OF FIRE PROOF VAULTS, Safes, Iron Window Shutters and Doors, cast and wrought iron railings, and all kinds of ornamental iron work. Also, heaters for public and private buildings.

In the manufacture of iron railing, either wrought or cast, over five hundred designs in their possession may be examined, embracing all the most beautiful patterns of the eastern countries, public and private buildings.

Every article in their line, made with despatch; and warranted equal to any manufactured in the United States. No. 41 Third street, St. Louis, Mo.

General Agency at Dubuque, Iowa.

FOR Public Lands—Real Estate—Military Land Warrants—Payment of Taxes—Investigation of Titles—Amicable Collection of Debts, and all other business within the legitimate sphere of an Agents duties, by

CHARLES CORKERY,
Notary Public and Commissioner of Deeds and Depositions for all the North-western States, Missouri, included.

October, 1850.

ROLIN CLARK, JOHN RENFREW, } PHILANDER BRALEY, ALEXANDER CROSIER.

Eagle Foundry and Engine Shop.

NORTH west corner of Main and Biddle streets. Manufacturers of all kinds of machinery, boilers and sheet iron work, portable circular saw mills always on hand, all orders executed with fidelity and despatch.

Thomas Grey,

BLACKSMITH and Iron Worker, No. 90 North Second Street, between Olive and Locust, St. Louis Mo. Keeps constantly on hand, and manufactures to order, Ox Chains, Sleiges, Wedges, and every description of Mining Tools, also Iron Hobbles and Picket Pins. ☞ Blacksmith work for Housebuilders, at the lowest prices. ☞ He has always on hand, the highly recommended *Iron Frame Bedstead, and Camp Stool.*

J. Henwood,

Hat Manufacturer, 72 Chesnut Street, St. Louis, Missouri.

Missouri State Mutual Insurance Company.

DIRECTORS:—John O'Fallon, C. M. Valleau, Reuben Knox, Daniel D. Page, Oliver Bennett, John Sigerson, John S. McCune, Joseph A. Eddy, True W. Hoit.

This company is established upon the mutual principles of insurance, and is emphatically a home institution. The fire risks of this company are extended into all parts of this State. Its earnings are never employed or invested in stocks or real estate, but kept for the prompt liquidation of losses, and under the immediate control of the Directors. Every person insuring with this company becomes interested in its success, and its profits instead of being divided among a few stockholders, belong to those who insure in this company.

The Directors aware of the importance of a well secured fund, reliable in case of loss, and ample under all ordinary calamity, assure the public that they have already a pledged fund, ample and reliable for any contingency, with a monthly increase of premiums of over ten thousand dollars. For the length of time this company has been in operation (six months) its business has been extended into all parts of the State and the city, and has received from the public a liberal patronage, which has placed it upon a permanent basis.

By an act incorporating this company, the parties insuring property therein, are entitled to the entire profits of the institution, the premium notes are also pledged by the charter for the payment of losses.

The portfolio of the company is at all times open to the inspection of its members and those wishing to make insurance with it. Policies are issued from thirty days to six years, thereby effecting a permanent insurance, with a return premium of from fifteen to fifty per cent, according to the term of insurance.

Agents for this company, may be found in all the principal towns in the State to whom application may be made.

Office of the company over E. W. Clark & Brother, corner of Main and Olive streets, Exchange building, where insurance will be effected at the tariff rates of preminm.

C. M. VALLEAU, President,

H. D. BACON, Treasurer.

S. F. LEDYARD, Secretary.

John Loughborough,

ATTORNEY AND COUNSELLOR AT LAW,

OFFICE—No. 56 Pine street, near Third, (adjoining that of the Clerk of the Supreme Court.)

Home Mutual Fire and Marine Insurance Company of St. Louis.

NOTWITHSTANDING the heavy loss sustained by this company in May last the stock notes now on hand amount to $350,000. The stock notes of the company are secured by lien upon real estate and approved endorsers. Office, No. 120 North Third street.

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ISAAC L. GARRISON, President,

D. D. PAGE, Treasurer,

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(Late of Wilgus & Watson.)

NO. 51½ 40' Pine street, between 2d and 3d, next door above the old s tand of Wilgus & Watson, house, steamboat, sign and ornamental painter, grainer, glazier, whitener and paper hanger; also, dealer in all the latest styles of French and American paper hangings. He keeps constantly on hand and ready for sale mixed paints of all colors, oils, varnishes, Japan, turpentine, white lead, putty, and a large and superior assortment of French and American window glass, which will be cut to any size to suit customers.

☞ Particular attention paid to estimating on houses or steamboats. nov.

Saint Louis Furniture Store,

WM. M. HARLOW, proprietor. Manufactures and keeps constantly on hand every variety of household furniture, matresses, window blinds, willow ware, &c., &c.

Also, manufactures to order every article in his line, with despatch. Orders from abroad promptly attended to, and goods carefully packed. All goods warranted as recommended.

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THE BANKING HOUSES OF ST. LOUIS.

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Page & Bacon,

Banking House, No. 139 Main street, St, Louis; next door to the Bank of Missouri.

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Interest paid to depositors, drafts and notes collected, sight and time bills purchased and sight exchange on the eastern cities and New Orleans for sale at the lowest rates in sums to suit purchasers.

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Interest paid to depositors, drafts and notes collected, sight and time bills purchased and exchange on the eastern cities and New Orleans for sale at the lowest rates.

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Bankers and Exchange Dealers, No. 83 Main st., east side, third door north of Olive st.. St. Louis, Mo.

Interest paid to depositors, drafts and notes collected, sight and time bills purchased, and sight exchange on the eastern cities and New Orleans for sale, at the lowest rates. in sums to suit purchasers.

S. HASKELL. JA'S. E. FRANCISCUS. J. H. BILLING.

EXCHANGE BANK.

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BUY and sell exchange on all the eastern, western, and southern cities; all kinds of bank notes, and Foreign Gold and Silver.

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The St. Louis Union

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M'Murray & Dorman,

IRON Railing Manufactory corner of Third and Pine streets continue to manufacture at the above establishment, all kinds of Plain and Ornamental Iron Railing, Balconies, Bank and Jail Doors, Book Safes, Fire-Vaults, Iron Window Shutters, Iron Awnings, Lightning Rods, Bedsteads, Gratings, and in fact, any thing which can be formed of Iron.

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ATTORNEY AND COUNSELLOR AT LAW,

Office—No. 97 *Chesnut Street,*

St. Louis, Mo.

Charles & Hammond,

BOOK AND JOB PRINTERS,

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